The Builder.

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Students' Drawings at the Institute.

THE drawings sent in competition for the various prizes offered to students by the Institute of Architects are at present on view to the public at the large room of the Alpine Club. The designs for the Soane medallion are hardly equal in average merit to those of the last two years, when the subjects, it must be remembered, were exceptionally attractive and suggestive. This year's subject, "A University Theatre on an Open Site," does not convey quite such a distinct idea as to what is required, as those of either a monumental Swimming Bath or a Town Church (the two preceding subjects), and a good many of the competitors seem to have taken rather too ambitious a view of the problem, and produced designs which are more in keeping with a "manufacturing centre" than with the quiet and refinement which should characterise the buildings of a University town. The circular form of plan seems to have been rather a favourite, and this is a mistake, as such a plan does not express the conditions of a building where there is to be a platform for special dignitaries at one end or side of the room and the remainder is an auditorium; and a circular plan, moreover, seldom results in a building which is acoustically good for speaking.

The author of the design which has obtained the medal, Mr. F. J. Horth, has adopted a long plan with an apse at each end, the one at the further end containing the platform; at the sides are columned recesses, above which are galleries. The plan is one of the best, probably the best, and the manner in which the various small subsidiary apartments are worked in on the exterior boundary of the plan is ingenious—perhaps a little too much so. The design is Classic, with a columned portico and a good deal of rustication, and the building is roofed somewhat after the manner of St. Sophia, with semi-domes over the apses. The interior perspective is a clever drawing and looks well, only we do not like the rather disturbing outline of the central decoration. The exterior treatment is correct Classic without very much refinement, an impression perhaps increased by the thickness of line used in the drawing. But the sense of unity of scale is much better in this than in most of the other designs, and we quite agree with the award. The "Honourable mention" design, "Gable Endie," by Mr. David Smith, shows an inner plan in a complete circle, with one portion of the area arbitrarily cut off for the platform, which is not at all an architectural method of planning. What gives value to the design is the treatment of the exterior, in which also rustication is largely employed; it has some picturesque and original points, and is more refined in treatment than the selected one; the detail elevation is perhaps the best thing among the Soane drawings, though the plan is decidedly inferior to Mr. Horth's.

Among the other Soane designs that signed "Jonah Man" shows a very ambitious set of drawings, with a plan with a large semi-circular recess on each face—a very bad form of plan practically, since many of those seated in the side recesses could only see a speaker who stood at the very front of the platform. The large dome is, in its treatment, entirely out of scale with the substructure. "Rotunda" shows a clever set of drawings betraying French influence, especially in the well-executed interior perspective, which, however, is quite out of keeping with the idea of English University architecture. The plan is a complete circle with a corridor outside and square annexes. The exterior design is pretty but rather gewgaw in character, and shows again, as in so many of the others, the want of definite ideas in regard to scale.

The subject for the Tite prize was "A Crescent in a large City"; we presume that there was a further instruction that the crescent should be considered as pierced by two streets symmetrically placed at each side of the centre axis, as all the designs show that feature. Mr. Heaton Comyn's design, to which the prize has been awarded, is in the main the best, and is shown in a charming set of drawings, including a finely worked out detail elevation besides the artistic perspective sketch in pencil. The streets are spanned by wide rusticated arches, above which is a colonnaded loggia; the order shown in this is continued by pilasters along the remainder of the façade. The ground story, more than half the height of the whole façade, is in plain rusticated masonry, the order occupying the upper portion of the height. The façade is perhaps a little too nearly divided, vertically, into two equal halves, but that is about the only criticism that need be made, the whole design being one which would do credit to any architect. A semi-circular

formal garden is laid out on the central area, with a tower or campanile on the centre of the chord. The author has taken the commendable trouble of giving the complete plan of the buildings forming the ground story, so as to show how the design could be practically utilised. A medal of merit is awarded to the design marked "Porthos," by Mr. A. D. Nicholson. Here the ground story is lower in proportion than in the prize design, thus avoiding the division of the height into two halves, but the heavy and massive order, engaged columns in the central block and pilasters in the side ones, rather crushes the ground story. The attic is treated in a monumental manner with square windows and very large triglyph piers, rather too large in scale for the rest of the design, but nevertheless this portion of the front has a solid and massive effect, and the whole set of drawings is a very creditable one. We share, however, the surprise expressed on another page by our correspondent Mr. Spiers, that such a design as "Red Shield" should have been passed over with no recognition. It at all events runs the prize design very close, and is unquestionably superior to any other in artistic feeling. The façade shows an open colonnade of coupled columns above the street arches; the central block is emphasised by a picturesque central pavilion, with sculptured figures above the cornice, echoed by smaller central features in the side blocks. "Bydand" shows a good general conception, though weak in drawing and detail.

The Grissell medal, given for "A Timber Spire or Lantern Termination to a Tower," we suspect has been partly awarded for the artistic merit shown in the drawings by Mr. W. Hepburn; a merit which we fully appreciate; but it should be remembered that the Grissell medal was founded to provide for the study of construction, and that ought to be the main consideration in the award. Mr. Hepburn shows a perspective sketch of a plain square stone tower of great height, pierced by small openings and crowned by a timber lantern in oversailing stages, with a smaller octagonal lantern rising from it. The drawings are beautifully executed, and the manner in which colour is introduced in the timber work is admirable; the whole set of drawings is most artistic and the greatest credit to its author, and all the construction is conscientiously shown; but we cannot help feeling that this vertical building up of timber staging is an easier constructive problem than that of a lofty timber spire, such as is shown in Mr. Barclay's design, to which a medal of merit has been awarded. The exterior design in Mr. Barclay's drawings, though very well and carefully set out, is no doubt commonplace in comparison with that of Mr. Hepburn, but then the Grissell prize is for construction and not for design. We have noticed a considerable tendency during the last two or three years to impart an æsthetic element into it, which is all very right, but that should (in this particular case) be a secondary matter. Mr. Barclay's spire construction is very well and thoughtfully carried out, but in this and one or two other sets of spire designs we are tempted to ask whether the apex of the spire is tied down into the centre of the structure as scientifically and effectually as it might be. "Oak" shows a creditable piece of construction: but his short struts abutting against blocks which are kept in their place by a screw-bolt through the timbers, form a weak point, as the thrust is really a shearing strain on the bolt. The blocks should have been notched into the bearing timber. On the whole, the Grissell designs are a highly creditable set, and there is no doubt that the prize lay between the two that are placed first, but we are not sure that their positions should not have been reversed.

The Arthur Cates prize of forty guineas, given for certain specified classes of drawings submitted by those who have passed the Institute Final Examination at one sitting, has not been fully awarded this year, the best man, Mr. Winton Newman, having been awarded half the value of the prize, twenty guineas. We do not know in what particulars Mr. Newman was considered to have been deficient; but looking at his exhibited drawings we should think that the winning of the prize has been made rather unnecessarily difficult, if these are not considered adequate: they are certainly a most creditable set. Mr. Baxter Greig has an Honourable mention in the same competition, for drawings which include a good design for a Late Classic Town Hall.

The Owen Jones travelling studentship has this year gone to the wrong man—from the architect's point of view. It is true that a painter would probably have chosen the set by Mr. W. Davidson which has been awarded the prize, but the prize was not intended for a collection of pretty pieces of colour; it was intended for the serious study of colour applied to architecture. This the drawings by Mr. W. Davidson are not. They are fine enough studies, in their way, of scraps of decoration. Portions of Rood screens from Norfolk, fragments of pavement from Florence, and single lights of stained glass windows make the bulk of the work; the only complete schemes of decoration shown are of two Elizabethan tombs of small importance. The drawings are moreover not well drawn, and in the case of the Della Robbia over-door the colour is also untrue and bad. In our opinion the work of Mr. James Maclachlan, which receives no award, should have won the studentship. The colours are certainly somewhat crude; but as illustrations of remarkable subjects they are well chosen and valuable as records. The Mosque at Cordova is worth the time and labour expended upon it, and the man who has studied in that way is more likely to benefit by extended travel than the collector of pretty fragments. The roof of Blythburgh Church, Suffolk, is a beautiful drawing of coloured decoration, suitable for the climate and for purposes of the present day. Mr. H. Morley receives a medal of merit, presumably for his drawing of the enamelled terra-cotta altar-piece attributed to Andrea della Robbia; his figure drawing is simple, clear and accurate—the best of any shown. The water-colour sketches are less happy, being rather untidy and restless in colour. Mr. L. R. Guthrie shows excellent measured work from Venice and Granada, but seems to us to have spoilt his chance by submitting an original design, the architectural lines of which are of poor proportion, and the colour decoration patched on to it in an unconvincing way. A set of drawings made entirely in England, either of English subjects or of foreign examples at the national museums, is shown by Mr. Lishman; they show a nice feeling for colour, but the handling of the sketches is not very deft, and they show a rather unpleasant yellowness running through them.

The prize involving what used to be thought the most fascinating work of all is that for the Pugin Studentship. At present, however, the study of Gothic buildings is not in so much favour as those of a later period; without entering into the controversy of styles, the facts are indicated by there being only two competitors for this prize—the third places himself out of court by illustrating only Jacobean work. But Mr. F. C. Mears well deserves the prize he has won with so little opposition. He shows a representative collection of studies of Gothic architecture that have evidently been a pleasure to him to make; they are not brilliant drawings, but informing studies well chosen. Some of the instances of domestic architecture are attractive, and it is a pity that the sketch of Great Aessingham, Norfolk, is so slight, for it suggests a most unusual house of the Gothic period. Part of Pershore Abbey is shown with good measured drawings, and some beautiful font covers. Mr. W. S. A. Gordon gets a medal of merit for a set of clever drawings, the author's delight being evidently rather more in the drawings than in the architecture, and probably for this reason the measured drawings are the most satisfactory.

The drawings will remain on view at the Alpine Club till the 30th inst., from 10 a.m. to 8 p.m. We hope that some of the outside public, as well as the architects, will think it worth while to go and see what our architectural students are doing. They should find much to interest them in the exhibition.

A NOTE ON MODERN WOOD-CARVING.

WE are induced to make some remarks on this subject mainly in connexion with the publication of an excellent little book,* a better book than in these days the public has any right to expect on such a subject as wood-carving. The tendency of—manufacture and commerce—the whole tendency, indeed, of science and civilisation—has been for a long time well-nigh fatal to the existence of handicrafts and the lesser arts. It is strongly characteristic of this tendency that the poet whom, of all others, his own and this generation have delighted to honour, is said to have invested his patrimony in a business the object of which was to produce wood-carving by machinery. But, curiously enough, the poet's insight,

* Wood-Carving: Design and Workmanship. By George Jack. London: John Hogg. 1903.

though super-added to that of the business man, was in this instance deceived, and the poet lost his capital. It is true that French cabinet-makers produce a substitute for wood-carving that is stamped in sawdust and blood; but they have not yet monopolised the market, and wood-carving is still a handicraft. It is a handicraft, moreover, of which there are still masters, such as the author of this admirable book, whose work will compare favourably with that of the greatest of their predecessors; but, like all other handicrafts which have not yet been actually displaced by mechanical agencies, this of wood-carving already exhibits the premonitory symptoms of their fatal influence.

Consider an example of wood-carving in its simplest form—the cutting of short rounded chamfers such as are frequently seen upon Gothic furniture, or upon country carts and waggons of the present day. Set a good and conscientious joiner from a builder's workshop to the cutting of such chamfers, and instead of leaving them crisp and vigorous, with the polished marks of his chisel, he will finish them off with spoke-shave, scraper, and glass-paper, each the exact facsimile of every other, until it is almost impossible to distinguish his handiwork from the productions of a good machine. So it is also with the average wood-carver properly so-called. He is one of the few remaining craftsmen whose work has not been taken out of his hands by the development of a mechanical industry, and instead of feeling the privilege of his position, it would seem that he wishes for, and courts, the catastrophe that has befallen his brother workmen. In the execution of geometrical or conventional patterns, though his work is not done by a machine, he would fain make it seem that it were. He aims above all things at superficial finish, mathematical exactness, monotonous repetitions and symmetries. He seems to hanker after glass-paper and French polish; he would fain remove the last minute traces of that manual labour of which he is apparently ashamed. When he aspires to the treatment of natural forms the same desire for exactness and finish leads him into mistaken attempts at an impossible realism by which his art is immediately vulgarised and debased; and he is further encouraged in these errors by a public taste which is vitiated, like his own, by the abominable wares of our modern manufacturing capitalists.

Through all the earlier and more practical part of Mr. Jack's book these difficulties and dangers by which the young wood-carver is beset seem to be almost wholly ignored. Until the last two or three chapters one would imagine in reading that all was well with the craft, and so admirable are the instructions given, with respect both to workmanship and design, that if only the author could have his way with readers and pupils all might be well indeed. But the fault, and almost the only fault that we have to find with this excellent book, is that the author does not seem sufficiently determined to have his way with his audience; it is as though he lived and wrote in a golden age of the handicrafts; he does not set himself resolutely to counteract those tendencies, already alluded to, by which, as by a strong tide, the young wood-carver will be swept away so soon as he grasps the chisel. That this complacency is not due to any failure of insight into the present conditions of the craft is, however, abundantly proved in the last two chapters. These contain not only a fascinating picture of the country craftsman of old times, but a perfectly clear and sufficiently heart-rending analysis of the changed conditions under which the modern wood-carver lives and works, with such generally poor results. The absence, therefore, of negative emphasis or militant criticism in the earlier part of the book must be ascribed, we suppose, to that serenity of temper which may still be enjoyed by the craftsman who knows that his own work, at all events, is above reproach.

In its affirmative aspect, as we have already said, the book is entirely admirable. The absolute necessity that the craftsman should make his own designs, and this with due respect to the limitations of his art, and to the destined position, use, or application, of the work before him; the superlative importance of "texture" in wood-carving, and of the distribution of lights and shades; the intimate co-relation of wood-carving with the other architectural arts; all such great principles as these are strongly insisted on, and the executive processes of the craft are well and clearly described. The value of the book, moreover, is immensely enhanced by the numerous and excellent illustrations; and its literary quality is greatly superior to that of the average text-book.

NOTES.

The Garden City.

THE recent meeting of the Garden City Association was hopeful in its tone, but, much as we wish success to the enterprise of establishing on the three thousand odd acres of Hertfordshire what the promoters rather fancifully call a garden city, we still have grave doubts as to the scheme. It may well be that with a good train service an agreeable and not expensive collection of habitations for City clerks and others may be established. The Baroness Burdett-Coutts was able to create something of the kind in Holly Village, Highgate. It is, however, a different matter to unite a business centre to a pleasant rural suburb in one place. Sunlight City, as it is called, is a collection of dwellings the property of a single company, but the garden city in Hertfordshire is to be a city of various miscellaneous people on an ideal system. However, when the project is more fully developed we shall be able to speak of it more definitely.

Building Materials in Egypt.

A RECENT report of the British Chamber of Commerce in Egypt contains some useful hints for many business men in this country. It points out what a large amount of private and public building is taking place at the present moment in Egypt, and that the British manufacturer is not taking full advantage of the opportunities now offered to him. For example, Belgium and Germany have a practical monopoly of the trade in steel joists, and the same story is told in regard to lead and iron piping, sanitary goods, paints, and oils, and ironmongery for doors and windows. Lifts, it is mentioned, are supplied almost entirely from Italy. It would appear that the English goods are too expensive, and possibly of too high a quality for the purpose for which they are required. That English goods for building purposes should be of first-rate quality is very satisfactory, and if the English manufacturer does as large a business in them as he desires, there is no reason why he should supply inferior goods at a smaller cost. If, however, he is knocked out of the Egyptian market not because he does not care for it, but because he will not adapt his goods to it, he has only his own want of energy to thank.

Engineering Standards Committee.

ONE of the most useful publications of this body is a report by Professor W. C. Unwin. This document deals with the variation of percentage of elongation with different gauge lengths and sections of test bars. It is generally admitted that for any given test bar the total elongation is made up of two parts, one due to general extension between the gauge points, which is proportional to the length, and the other to local contraction, which is practically independent of the length of the bar. But it has not been so commonly recognised that the elongation due to local contraction depends on the cross section of the bar, and that for a given gauge length the percentage of elongation must vary with the cross section, and increase for a given gauge length as the cross section increases. There would be no difficulty in comparing the elongation of different test bars, if general elongation alone were measured before local contraction commenced. But this could only be done by taking an autograph diagram for every test, a procedure impracticable in ordinary testing. The tests undertaken by Professor Unwin covered a wide range of conditions, and the results afford valuable data, such as have never before been available in so complete a series. The report will certainly be of great service in helping the committee to determine the most suitable proportions for standard test bars, but, apart from this point, the records possess a distinct value of their own.

The Inventor of Portland Cement.

VERY few of the thousands who make use of Portland cement, and still fewer of the millions who benefit by its use, have ever heard of Joseph Aspdin, the inventor of a material to which we owe many of the great engineering works of the present day. Aspdin was a Leeds brick-maker who, in 1813, conceived the idea of combining chalk with clay from the river bed, drying and calcining the mixture at a high temperature. In the year 1824 he patented the invention, and soon afterwards opened a small cement manufactory at Wakefield, and a few years later his son William Aspdin established a cement factory near Chatham. The peculiar advantages of the new material were soon recognised by engineers, and Brunel was one of the first

to make use of it, employing Aspdin's patent cement in the construction of the Thames Tunnel. It is true that rival claimants have arisen to claim the honour of inventing Portland cement, but it is now recognised by competent authorities, not only in this country, but also in France, Germany, and Italy, that the palm belongs by right to Joseph Aspdin. In other departments of work, there is a commendable readiness to recognise the services of those who have contributed to the advancement of science and art, but at the present moment Aspdin is literally a forgotten genius. The suggestion is now made that a public memorial should be raised in Leeds to the inventor of Portland cement, and we feel sure that this proposal will meet with the hearty support of architects, engineers, and contractors in all parts of the world.

The First Modern Ship Canal.

IN these days of ship canals we hear little or nothing about the earliest enterprise of the kind during modern times, namely, the Berkeley and Gloucester Ship Canal. Although Gloucester is situated on the Severn, access to the port is really afforded by the canal. Owing to the dangerous condition of the river, an Act was obtained in 1793 for the construction of a ship canal commencing at Berkeley, some sixteen miles lower down the Severn, and the works were completed in the year 1827. This waterway follows the Vale of Berkeley, originally commencing with a tidal-basin and lock at Sharpness Point and ending at the docks in Gloucester, where there is another lock communicating with the Severn. The original cost was about 500,000*l.*, but within the last forty years considerable outlay has been incurred in opening a new entrance half a mile lower down the river, with additional dock accommodation. These works were finally completed in 1874. Although vessels of more than 600 tons cannot pass up the canal to the port, ships of 2,500 tons can enter the outer basin, where cargo is transferred to barges. The dimensions of this ship canal may be small compared with more recent developments, but its continuously successful operation has certainly had some useful effect in the encouragement of more ambitious schemes of the same kind.

Raising a Sea Port.

THE city of Galveston, one of the most important seaports of the United States, is situated on a low, sandy island so little above the sea level that the arduous undertaking of raising the entire area is about to be commenced. A great sea wall has already been constructed, and the filling which is to raise the city level by no less than 7 ft. will require the delivery of some eleven million cubic yards of sand over an area of nearly two square miles. It is proposed that the material shall be procured by hydraulic dredging, and operations will be facilitated by the construction of a distribution canal at the back of the sea wall. This scheme represents one of the most determined efforts hitherto made to overcome the natural disadvantages of a site, and the operation will certainly be watched with interest. Judging from recent, as well as from previous, experience, something of the same kind is very much wanted at St. Petersburg.

Induction Motors.

THE paper by Dr. Behn-Eschenburg on induction motors, an abstract of which was given to the Institution of Electrical Engineers last week by Dr. Silvanus Thompson, is the first really valuable paper on the subject which has appeared in English. The author is the engineer to the famous Oerlikon Machine Works in Switzerland. Many of their machines are in use in factories and central stations in this country, and many of our ablest engineers have served their apprenticeship with this firm. The paper gives evidence of the exceedingly careful manner in which all machines turned out by this firm are tested before leaving the workshop, and Dr. Behn-Eschenburg has placed at the disposal of engineers the results of long and expensive tests on the effects produced by slight alterations in the design of induction motors. The history of the gradual evolution of the induction motor from Faraday's experiment of the effect of placing a metal cube in a rotating magnetic field is one of the best examples of the practical difficulty there is in saying who is the first inventor of a machine. One improvement inevitably led to another, and the very long list of patents in connection with induction motors show the number of electricians that have worked at it. We were sorry that the author did not give more data in connexion with single phase motors. The number of three-phase supply systems in this country is still very limited, and so the design of three-phase motors interests only a few manufacturers. From the point of view of the mathematician, there is a great deal to criticise in the paper. It is difficult to find out what the author means by self induction and mutual induction. The terms have not their usual meaning, and the formulæ he gets appear to us to have an extremely limited application. We think it a great mistake of the Institution to discourage authors introducing proofs of mathematical formulæ into their papers. It is true that only a few engineers would understand them, but the mere proving of the formulæ would necessitate accuracy of definition, disclose unwarrantable assumptions, and prevent illogical deductions. The value of the formulæ given in this paper would have been immensely increased if the simple proofs, which are not yet published in any English book, had been given. The translation of the mathematical symbols into English has been badly done, and a little judicious editing would have made this paper invaluable to the electrical designer.

Middlesex County Records.

A JOINT committee of the Court of Quarter Sessions and the Middlesex County Council propose to publish a volume, covering the interval 1689-1709, of a calendar which they have prepared of the sessions books for the period 1689-1760, and thereby to resume the labours begun by the late Middlesex County Record Society. The issue will be limited to 500 copies, and sold at the actual cost price of 13s. the volume. As the undertaking is not of a commercial character, it is hoped that the entire issue will be subscribed for, so that the committee may be enabled to accomplish their project. The County Records begun with the reign of Edward VI., and, in pursuance of a decision given by the High Court of Justice some years ago, have been committed to the custody of the Custos Rotulorum of Middlesex; they are now stored in specially constructed muniment rooms in the Westminster Guildhall. Under statutory powers obtained in 1898 the cost of repairing, restoring, binding, and calendaring the records can be defrayed out of the County rate, but the committee are of opinion that the printing and publication of the calendar should be made to pay for itself, and should not fall upon the rates.

Royal Academy Lectures.

THE second of Professor Clausen's lectures on Painting, dealing with "Lighting and Arrangement," was so interesting, both in its matter and its illustrations, that the allotted hour came to an end before one expected. Premising that the greatest difficulty of painting lay not in the execution of this or that detail, but in the marshalling of the whole, and giving some quotations from Leonardo's treatise on painting showing the importance that artist attached to *rilievo* (*i.e.*, modelling by light and shadow), Professor Clausen went on to remark that it was possible to arrange the personages and objects in an interior so as to emphasise, by lighting, what it was wished to emphasise — Velasquez's "Maids of Honour" being given as an example, showing also the frequent arrangement of light and shadow being massed on either side of a diagonal line, a device illustrated also in a beautiful example of Corot. Outdoor sunlight was often a difficulty, as figures could not in painting show in high light against a daylight sky, though it might be done in evening light, as was shown in Titian's "Sacred and Profane Love."* In sunlight, painters had to take advantage of cloud-shadows and other incidents of shadow to bind the scene together and emphasise special figures; or a high horizon might be taken and the sky entirely suppressed, as in Bastien-Lepage's "Les Foins," in order to concentrate the highest light on the faces. Much might be learned by noticing how nature appeared at unpremeditated moments. Too much effort must not be spent on mere imitation of separate incidents; all painting was a partial statement, and each artist had his own form of compromise with nature. The Flemish painters seemed to have looked closer at their models than the Italians, and excelled in minute detail and texture, but did not give so broad and general a conception as the Italian painters, who, with less careful painting of texture, appeared to have considered their subjects at a greater distance and in a wider air. Thus Holbein's "Ambassadors" was a work splendid in each part, but not complete and balanced as a whole. Then it must be remembered that the incidents which were but indis-

* So call'ed; it is very doubtful whether this was really the idea intended in the painting.

tinctly seen in nature were not to be further elaborated in a picture. Painting dealt with appearances, not with facts, and it was the drawback of photography that it showed what the eye could not see, and thus destroyed the balance of natural effect. It was a curious fact that photographers, in their wish to put photography on the footing of an art, were actually now endeavouring to get rid of this hard accuracy of fact, and to imitate in their productions the uncertain appearances of nature.

Royal Academy Lectures—continued.

IN his third lecture, on Monday last, Professor Clausen considered the subject of Colour, which he said had a power of poetic suggestion in itself, independent of subject. We never saw colour as it really is, but as affected by contiguous colours. Every colour tended to produce its complement on contiguous surfaces, except violet, which seemed to possess a quality of spreading its own colour over surrounding objects. Our range of pigments was not equal to the range of light. If a portrait were painted of a man in evening dress, the white shirt front would be the high light; but if he wore a diamond stud, that could not be represented without sacrificing the white of the shirt front, as we had nothing brighter than white in pigment. So it became a question, often, whether the light on the landscape should be sacrificed to that of the sky, or the contrary. Where lights were warm shadows were cool, and *vice versâ*; but the warmth of effect produced by sunlight was sometimes overlooked in painting, and we had sunlight landscapes with no effect of sunlight in them. Latterly the effort to combine light and colour had led some painters to a system of painting entirely in separate spots of colour, but this had led to exaggerated effects. Light, however, could only be expressed in pigments by contrast: Thus Turner painted a dark tree against the sky to render the sky luminous, and the dark foregrounds in old landscapes were introduced for the same reason. *Quality* in colour was an important element, difficult to define but easily felt. Two painters would spread the same blue over a canvas: one would give the impression of blue sky, the other only of blue paint. In water-colour quality almost made itself, but in oil painting the artist had to make his own quality. Colour had an emotional power: Rembrandt's sad golden tone in itself appealed to the imagination; but in these days we were more literal, and endeavoured, like Velasquez, to find the colour in nature as it existed. Chardin, Manet, and Millais were among the most successful modern artists in this respect. There were two methods in building up the colour scheme of a picture; the simple one of laying on the right colour at once, or that of laying a foundation of lights and darks in monochrome, and partially glazing over with colour. The advantage of the latter was that if colour faded to some extent, the balance of light and dark was still preserved. Colour was the quality which availed most to rank a picture among masterpieces [we should think this a little open to question—it must not be pushed too far, at all events]. In conclusion, Professor Clausen said that many people were pleased with a portrait or a landscape in proportion as it seemed to them "exactly like nature." But nature did not give up everything; and the study of painting by those who were not painters would lead them to see that there was much more in nature than could be represented by attempts at literal imitation.

Mr. Spielmann on Modern Sculpture.

AT the London Institution, on Monday last, Mr. Spielmann gave an interesting discourse upon modern sculpture. Sculpture, which on the whole ranks first among the arts to-day, appeals to a much smaller public than painting, and lectures that make known its aims are therefore to be desired. While expressing some of the aims of the sculptor, Mr. Spielmann quoted Michael Angelo's dictum that "the more sculpture looked like painting the worse it was, and the more painting looked like sculpture the better it was." A comment on this was Mr. Clausen's recent remark to the students at the Royal Academy, mentioned in our note on his lecture last week, that with the introduction of shadows the painter's difficulties began. Michael Angelo's saying is a good working one, and was made obvious at once by the illustrations thrown on the screen. These included a view of Mr. Brock's model for the Queen Victoria Memorial, which has hitherto been seen only by a few of Mr. Brock's personal friends. Mr. Brock came in for unstinted praise at the lecturer's hands, only perhaps surpassed by his admiration for the works of the late Lord Leighton and Mr. G. F. Watts. While admitting Mr. Frampton's great ability and all-round knowledge, his methods came in for less enthusiasm; the lecturer at the outset deprecated colour in sculpture and the use of more than one material. We do not ourselves approve of some of the liberties that Mr. Frampton has taken with the architectural setting and decoration of his work; but we think any materials or combinations of materials are legitimate in themselves, and if precedent is needed, are we not right in saying that the Greeks coloured their sculptures, Pheidias' brother being a colourer of sculpture by trade? Mr. Frampton has done a good deal to draw the arts together. Sculpture and architecture have been too long divided; it would indeed be difficult to write of them together in modern works; but if it were done, Mr. Frampton's and Mr. Harry Bates' names would be most prominent among the sculptors. When civilisation begins to require an architecture that will attract men of the calibre, say, of Mr. G. F. Watts, to follow it as their calling, Alfred Stevens's saying—"I know only one art," will be less of a curiosity to the general public.

The Women's International Art Club.

THERE is an exhibition of women's work at the Grafton Galleries, and, as is usual with women's paintings grouped together, the result is unsatisfactory. What good can come from collecting a large quantity of mediocre paintings, simply because they are the work of women, we fail to see. Surely no woman who is a good artist would be afraid of competing with men; if her work is not good enough for a general exhibition let her give up painting. Many of the paintings are almost entirely deficient in colour; there seems to be a fashion amongst lady artists, especially those studying abroad, of making dull-looking pictures, landscapes without sunlight, and portraits of people with unhealthy complexions. One turns with a sigh of relief to such pictures as "The Village Green" and "Sunshine and Shadow," by Mrs. Mary G. Hunter, and the three French scenes by Mdlle. Anna Boch, which, though rather "spotty," are brilliant bits of colour. There is also in the same room a pleasing portrait group of two girls, by Miss Gwenny Griffiths. Miss Alice Robertson, an English lady painting in Paris, sends several pictures; the only one we care for is "All is Vanity," an old woman with an expressive face holding up a necklace, a young woman in the background. "The Mother," by Miss Gertrude Leese, has a good effect of light, and Miss Marie Naylor's portrait of Miss Coombe is pleasing. Why should Mrs. Charlotte Mura want to paint such a vulgar thing as "When the Cat's away the Mice will Play"—two housemaids singing and playing on their mistress's piano? The Long Gallery is given up to water-colours, and the works of each artist grouped together. Those of Miss Evelyn Howard, Miss E. H. Adie, "Thunder Clouds," by Miss E. M. Lister, and some by Nancy Knaggs (Mrs. Arthur Copping) are amongst the best. Among the sculptors is Miss Rope, who sends some panels. Miss Emmeline Halse's two children, "Tired Out" and a "Victim to Art," are charming, as also are Miss Gwendolen William's contributions. There is a case of bookbindings, some needlework, and jewellery.

Mr. Elgood's Exhibition.

THE exhibition of water-colour drawings of "Gardens," by Mr. G. S. Elgood, at the gallery of the Fine Art Society, is a most fascinating one, and the artist may be congratulated on having made a progress of continual improvement in the treatment of his chosen subject, from one year to another, till in the present exhibition his work may be said to be perfect of its kind. These water-colours combine brilliancy of colour and minuteness of workmanship in the masses of flowers shown in the foreground in many of them, with delicate painting of sky and distance where distance is introduced; and when we come on a drawing entitled "St. Peter's, from the Pincio" (28), we find that Mr. Elgood has not contented himself, as some landscape painters would, with a shapeless dab of colour for the distant building, but gives quite a careful and finished little study of it in miniature; and in all the drawings in which architecture is introduced it is well and carefully treated, as again in the "Madonna del Sasso, Lago Maggiore" (43), where the middle distance is occupied by a picturesque and delicately treated pile of building. As to the majority of the subjects, which are purely and entirely garden scenes, Italian and English, they are all so good that we can hardly profess to make a selection of the best. The artist has fairly made garden painting his own.

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THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE sixth general ordinary meeting of the Royal Institute of British Architects was held on Monday at the Rooms, 9, Conduit-street, W., Mr. John Slater, B.A., in the chair, in the unavoidable absence of the President, Mr. Aston Webb, R.A.

Registration of Architects.

On the motion of the confirmation of the minutes of the last meeting of the Institute, when the question of the registration of architects was discussed,

Mr. G. A. T. Middleton asked whether the resolution which was eventually passed was in order, seeing that the original resolution as it appeared upon the minutes was not seconded, and that the resolution eventually put from the chair was not in the words proposed by Mr. McVicar Anderson.

The Chairman said Mr. Middleton was right on one point, and he would alter the minutes to the effect that the resolution which Mr. Middleton had proposed was seconded. But who seconded it?

Mr. Middleton said the resolution seemed to be seconded by several persons.

The Chairman said the minutes would be amended to the effect that the resolution was duly seconded. On the other point raised by Mr. Middleton, the minutes were absolutely correct. Whether the meeting intended to vote upon the resolution or not he could not tell, but the President entirely endorsed the correctness of the minutes—as minutes. That being the case, he could not allow any alteration of that resolution, for it absolutely stated what occurred. If there was some mistake it would have to be rectified at another meeting by a counter resolution.

Mr. Middleton asked if the resolution, as carried, was valid.

The Chairman said it was undoubtedly valid at the present moment.

The Late Mr. Saxon Snell.

Mr. Alex. Graham, Hon. Secretary, said he regretted to announce the decease, at the age of 73, of Mr. Saxon Snell, Fellow, elected in 1873. Mr. Snell had a very large practice in connexion with various metropolitan boards of guardians and other public bodies, and was particularly identified with the building of infirmaries, washhouses, casual wards, and like buildings in and about London. He retained to the last a keen interest in all matters relating to the planning and ventilation of hospitals. He asked every member of the Institute to agree to a vote of condolence to be sent to the representatives of the deceased, expressing the sense of the loss the Institute had sustained.

The vote was agreed to in silence.

Prizes and Studentships.

Mr. Locke, the Secretary, read the Deed of Award of prizes and studentships for 1903-4 made by the Council in writing, under the common seal.

The Deed of Award, made under seal pursuant to by-law 66, states that the Council have examined the works submitted for the Institute Silver Medals, the Soane Medallion, the Owen Jones and Pugin Studentships, the Godwin Bursary, the Tite Prize, the Arthur Cates Prize, and the Grissell Gold Medal, and gives particulars of the competitions and the results thereof as follows:—

The Royal Institute Silver Medals.

(i.) *The Essay Medal and Twenty-five Guineas.*—Eight essays on "The Delineation of Architecture" were received for the Silver Medal, under the following mottoes:—

1. Alpha. 2. "Ars longa, Vita brevis." 3. Bothwell. 4. "Floreat semper fidelis civitas." 5. "Fortuna sequatur." 6. "Resurgam." 7. "The 9th." 8. X.

The Council regret that they are unable to award the Medal, but they have granted a Medal of Merit and Ten Guineas to the author of the essay bearing the motto "X" [Claude Batley, Ipswich].

(ii.) *The Measured Drawings Medal and* 10*l.* 10s.—Twelve sets of drawings were sent in of the various buildings indicated, and under mottoes as follows:—

1. Archer:—6 strainers (St. Paul's Church, Deptford).
2. Baydo:—5 strainers (Morden College, Blackheath).
3. Caylix:—6 strainers (St. George's Church, Hanover-square).
4. Conger Eel:—4 strainers (Lady Chapel, Lichfield Cathedral).
5. Dolphin:—5 strainers (Church of St. Oswald, Ashbourne, Derbyshire).
6. En avant:—3 strainers (The Queen's House, Greenwich).
7. Erin:—4 strainers (St. Nicholas Church, Old Shoreham, Sussex).
8. Gothic:—5 strainers (Tideswell Church, Derbyshire).
9. Steeple-Jack:—6 strainers (Christ Church, Newgate).
10. Thane:—6 strainers (Glamis Castle, Forfarshire).
11. The Birds:—5 strainers (Priory Church of St. Mary and St. Blase, Boxgrove, Sussex).
12. Vis:—6 strainers (St. James's Church, Piccadilly).

The Council award the Silver Medal and Ten Guineas to the delineator of the Church of St. Oswald, Ashbourne, Derbyshire, submitted under the motto "Dolphin" [L. M. Gotch, West Ealing, W.], and certificates of Hon. Mention to the delineators of Tideswell Church, Derbyshire, and St. James's Church, Piccadilly, submitted under the respective mottoes of "Gothic" [G. S. Salomons, Manchester] and "Vis" [C. Lovett Gill, Regent's Park].

The Travelling Studentships.

(i.) *The Soane Medallion and* 100*l.*—Fourteen designs for a University Theatre were submitted, under the following mottoes:—

1. Aspirant:—7 strainers.
2. Dom:—6 strainers.
3. Gable Endie:—5 strainers.
4. Hal:—6 strainers.
5. Ionian:—5 strainers.
6. Jonah Man:—7 strainers.
7. Oxon:—7 strainers.
8. Phœnix:—7 strainers.
9. Rannock:—5 strainers.
10. Rotunda:—7 strainers.
11. Sanctus Boscus:—7 strainers.
12. Star (device):—4 strainers.
13. Tay:—7 strainers.
14. X:—7 strainers.

The Council have awarded the Medallion and (subject to the specified conditions) the sum of 100*l.* to the author of the design bearing the motto "Oxon" [F. J. Horth, Hull], and a Certificate of Hon. Mention to the author of the design bearing the motto "Gable Endie" [D. Smith, Dundee, N.B.].

(ii.) *The Owen Jones Studentship and* 100*l.*—Five applications were received for the Owen Jones Studentship from the following:—

1. W. Davidson:—6 strainers.
2. L. R. Guthrie:—6 strainers.
3. James M'Lachlan:—6 strainers.
4. Frank Lishman:—6 strainers.
5. H. Morley:—6 strainers.

The Council have awarded the Certificate and (subject to the specified conditions) the sum of 100*l.* to Mr. W. Davidson, Edinburgh, and a Medal of Merit to Mr. H. Morley, S. Kensington, S.W.

(iii.) *The Pugin Studentship and* 40*l.*—Three applications were received for the Pugin Studentship from the following:—

1. A. E. Bullock:—2 strainers.
2. W. S. A. Gordon:—6 strainers.
3. F. C. Mears:—6 strainers.

The Council have awarded the Medal and (subject to the specified conditions) the sum of 40*l.* to Mr. F. C. Mears, S. Kensington, S.W., and a Medal of Merit to Mr. W. S. A. Gordon, Hither Green, S.E.

(iv.) *The Godwin Medal and* 65*l.*—Two applications were received for the Godwin Bursary from the following:—

1. H. Phillips Fletcher:—6 strainers.
2. F. R. Hiorns:—6 strainers.

The Council have awarded the Medal and (subject to the specified conditions) the sum of 65*l.* to Mr. H. Phillips Fletcher.

(v.) *The Tite Certificate and* 30*l.*—Eleven designs for a Crescent in a large City were submitted under the following mottoes:—

1. Anglicé:—3 strainers.
2. Antiquum Obtinens:—3 strainers.
3. Bridge:—3 strainers.
4. Bydand:—3 strainers.
5. Colonnade:—3 strainers.
6. Canny Ainwick:—2 strainers.
7. Crescent (device):—3 strainers.
8. Fleur-de-Lis (device):—3 strainers.
9. Pecksniff:—3 strainers.
10. Porthos:—3 strainers.
11. Red Shield:—3 strainers.

The Council have awarded the Certificate and (subject to the specified conditions) a sum of 30*l.* to the author of the design bearing the motto "Bridge" [Heaton Comyn, Great Ormond-street, W.C.], and a Medal of Merit to the author of the design bearing the motto "Porthos" [A. D. Nicholson, Glasgow].

The Arthur Cates Prize: 40*l.*—Four applications for the Arthur Cates Prize were received from the following gentlemen:—

1. J. H. Gibbons:—11 strainers.
2. Baxter Greig:—15 strainers.
3. F. Winton Newman:—11 strainers.
4. John Swarbrick:—18 strainers.

The Council regret that they are unable to award the Prize, but have granted the sum of twenty guineas to Mr. F. Winton Newman, Hampstead, N.W., and a Certificate of Hon. Mention to Mr. Baxter Grieg, Dulwich, S.E.

Prize for Design and Construction.

The Grissell Gold Medal and 10*l.* 10*s.*—Fourteen designs for a Timber Spire or Lantern Termination were submitted under the following mottoes:—

1. Cardon:—3 strainers.
2. Carpenter:—1 strainer.
3. Celt:—1 strainer.
4. Dew:—2 strainers.
5. Eihcra: 3 strainers.
6. Ich Dien:—2 strainers.
7. Le Nord:—1 strainer.
8. Mente Manuque:—2 strainers.
9. Oak:—3 strainers.
10. Opal:—2 strainers.
11. Simplex:—2 strainers.
12. Skyline:—3 strainers.
13. Wee Macgregor:—3 strainers.
14. Yddraig Goch:—1 strainer.

The Council have awarded the Medal and ten guineas to the author of the design bearing the motto "Cardon" [J. W. Hepburn, Patsull-road, N.W.], and a Medal of Merit to the author of the design bearing the motto "Ich Dien" [A. Jas. Barclay, Aberdeen, N.B.].

The Ashpitel Prize 1902.—The Council have, on the recommendation of the Board of Examiners (Architecture), awarded the Ashpitel Prize to Mr. F. Winton Newman, of London. Mr. Newman was registered Probationer in 1895, Student in 1897, and passed the Final Examination in November, 1903.

The Travelling Students' Work.

Soane Medallist 1902.—The Council have approved the drawings executed by Mr. James B. Fulton, who was awarded the Medallion in 1902, and who studied in Italy, Gibraltar, Algiers, Malta, Egypt, Palestine, Turkey, Greece, Austria, Hungary, and Germany.

Tite Prizeman 1902.—The Council have approved the work of Mr. Charles Gascoyne, who was awarded the Tite Prize of 1902, and who travelled in Italy.

Tite Prizeman 1903.—The Council have approved the work of Mr. David Smith, who was awarded the Tite Prize for 1903, and who travelled in Italy.

Pugin Studentship 1903.—The Council have approved the work of Mr. J. Harold Gibbons who was elected Pugin Student for 1903, and who travelled in Gloucestershire and Somersetshire.

Lead Architecture.

Mr. J. Starkie Gardner, F.S.A., then read a paper on "Lead Architecture," of which the following is an abstract:—

The author first gave some details of the lead-mining industry in Britain since the earliest times, and referred to the use made of the metal in architecture by the Greeks in the Mycenæan period. The metal has specially valuable properties that distinguish it from all other metals. Capable of producing the most delicate and lace-like effects, or of covering with an impervious sheath the most extensive buildings, it equally defies the ravages of time and the corroding influences of air or of water. It succumbs to the attacks of fire alone. Under the murky pall of our great cities its hue deepens to a sombre black, but if weather-beaten in purer air it oxidises to a silvery white, producing contrasts of light and shade which are exquisitely beautiful. Formerly richer effects were obtained by gilding and painting in chevrons of colour or powdered devices, or by varying the surface with inlays of tin, or incising patterns and filling them with minium, white oxide, or black asphaltum. It quickly tarnishes, but freshly melted or cleaned its surface is lustrous as silver; and this might perhaps be preserved by coating it with vitreous glaze dissolved in fluoric acid.

The Greeks first applied lead decoratively in architecture. An Ionic capital from the Temple of Ephesus, in the British Museum, has its volutes inlaid with a fillet of lead. The idea of inlaying lead into stone may have reached the Anglo-Briton, the most expert metal-worker of that time, from the East. William of Malmesbury describes an ancient pavement in Glastonbury Abbey as formed of "stones designedly inlaid with triangles and squares and figured with lead." The finest existing example of fourteenth century work is that now in the Cathedral of Rheims (illustrated in the *Building News* for October 9, 1874). A sparing use of lead was made in ceilings and vaultings, where the gilded stars are of lead. The pomegranate

pendants and leaves at the intersections of the geometric ceiling to Cardinal Wolsey's cabinet at Hampton Court are of lead, like the enrichments to the ceiling of the Chapel Royal, St. James's. Windows, like those in Salisbury Cathedral, often depended for the decorative effect entirely on the grace and intricacy of their leaded lines. Beautiful plaques of perforated lead, usually lozenge-shaped, but sometimes square or round, replaced one or more of the quarries of a window for ventilation; they are met with in considerable variety in the offices and corridors of Tudor buildings, such as Hampton Court and Haddon.

The simplest and most natural method of using lead decoratively is to cast it in moulds. The Romans first employed a method of decoration used later by Sussex and other mediæval ironfounders. Small objects in relief, such as escallop-shells, beaded rods, plain rings, etc., were impressed as decoration into the beds of sand upon which the sheets were cast. Some richly decorated lead coffins were found under the pavement of the Temple Church.

The author touched on the uses of lead in relation to the plumbers' craft, which was first mastered on a grand scale by the Romans. In England lead pipes have been found in Roman foundations, and at Bath is a massive water channel of lead an inch thick. Water was brought into London houses by lead pipes for the first time in 1582 by Peter Morris, a Dutchman. Leaden spouts for relieving the gutters formed at times a picturesque feature in mediæval buildings. Of greater interest were the conduits or central distributing fountains which generally occupied some accessible place in one of the courts of every princely dwelling. Most of these were under canopies, and lead entered very largely into their construction. The decorated tank or cistern for storing rainwater may be of great antiquity; the earliest preserved of the sixteenth century bearing "E. R." and the royal arms was figured in the *Builder* for 1862 (p. 602). The author referred to several specimens of sixteenth century elaborately-decorated heads to rainwater pipes. In the old artistic days even the pump was made a vehicle for decoration, like that formerly in Leather-Sellers' Yard, which was surmounted by a mermaid pressing her breasts, out of which wine ran on State occasions.

In the seventeenth and eighteenth centuries much of the purely decorative statuary produced in England was of lead, especially the massive equestrian statues, the first of which, that of Charles I., by Hubert Le Sœur, was cast near Covent Garden in 1633 and erected by Charles II. at Charing Cross in 1674. The statue—horse and man—is still the finest we possess. For the garden lead reigns supreme. Softer and greyer in tone, more yielding, less costly, and less pretentious than bronze or marble, lead seems, above all other materials, to lend itself to the garden. An instance was referred to of four or five score of leaden statues dispersed over a gentleman's extensive grounds. They consisted of reproductions from the antique of eighteenth century renderings of gods and goddesses, and of more modern subjects, such as musicians, dancers, mummers, skaters, shepherds and shepherdesses, gardeners, etc., in contemporary costume—the latter group by far the most interesting.

As regards lead architecture, Eusebius speaks of lead roofs in the third century; and the domes of the Holy Sepulchre and St. Sophia are still so covered. The roofing in the seventh century of the Church of York with lead, by Wilfrid, and the sheathing of that of Lindisfarne, by Eadbent, both walls and roof, must have been new and unusual occurrences to have been chronicled by Bede. The development of pointed church architecture in the thirteenth century afforded much scope for a display of leadwork. The roofs rising to a great height, and becoming increasingly rich, with turrets, flèches, crestings, finials, buttresses, parapets, crockets, gargoyles, and, above all, the lofty steeples, often clustered in threes, as at Lincoln, Ripon, and Canterbury, absorbed more lead, and afforded greater areas for display than ever. In France the lead roofs appeared to form almost half, and by no means the least picturesque half, of many of the great sacred buildings. The laying of the lead in strips, vertically or diagonally, formed with their rolled overlaps fretted lines of shadow on the bleached white surfaces. Stowe describes the bell-tower of the Priory Church of St. John as "graven, gilt, and enamelled, to the great beautifying of the city, and passing all other that I have seen."

The Palace of Sheen, rebuilt by Henry VII., seems to have been the earliest revival of great displays of lead in domestic architecture in England, since the roofing with lead of a building earlier in the century had resulted in its being distinguished as Leadenhall. The roof of Richmond Palace was a forest of turrets, octagons, pinnacles, and finials, gold and azure, with the King's arms, and vanes surmounting them. Special ornaments to the building were the turreted lanthorns over the great hall, the clock-case at the west end, the lanthorn leaded and embattled with fourteen turrets over the privy lodgings, a round structure four stories high, called the Canted Tower, embattled and all covered with lead; besides the Chapel, Queen's and Prince's closets, Hall, Middlegate, and kitchen, decorated, embattled, covered with lead, and all equal "special ornaments" of the building. The Palace at Hampton Court, though not completely destroyed like Richmond, is shorn of the lead-covered cupolas, octagons, turrets, and louvres, bedecked with finials and pennons, all glittering in gold and armorial bearings, which rendered it the most attractive sight in all England.

But it was only where timber framing entered largely into the construction that the lead was carried down below the roofs and a truly lead architecture could be revived. The rural retreat of Nonsuch, a veritable palace of lead, dazzled the imagination and baffled description. The stanchions and outposts of the Banqueting Hall, three stories high, and its lanthorn, were "all covered with lead, as were the whole of the wooden battlements, perhaps, like those at Windsor, the great grace and special ornament to the whole building." The upper stories, at least, were "butted round with frames of wood, covered with lead," and these, with the turrets, water-tower, clock-case, etc., "are the chiefe ornament of the whole house of Nonsuch." But for the intrinsic value of its materials, especially the lead, the palace might not have perished.

In 1491, Thomas Wood, a goldsmith and sheriff of London, built a row of shops and dwellings in Cheapside, fronted with lead, which every chronicler speaks of as beauteous and glorious to behold. The front was gilded, and it was known as Goldsmith's-row. Stowe describes it as the most beautiful frame and front of fair houses and shops in London or elsewhere in England. It contained ten dwelling-houses and fourteen shops, all in one frame, uniformly built four stories high, beautified towards the street with the Goldsmiths' arms; and the likeness of Woodmen, in memory of the founder's name, riding on monstrous beasts. All which was cast in lead, richly painted over, and gilt. It was regilt in 1594 by Sir Richard Martin, Lord Mayor, and was destroyed in the Great Fire of 1666.

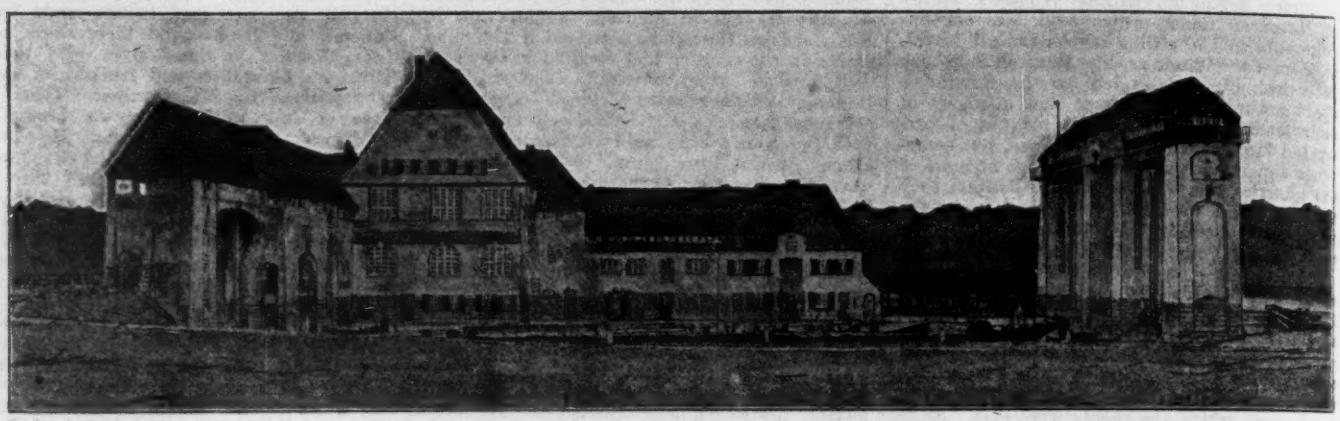
The author concluded by referring to some modern examples of ornamental lead work, mentioning particularly the bridge across Northumberland-street, connecting the Grand Hotel with its annexe. Some ideas were given for the newly fronting of old houses with ornamental leadwork, and for the treatment of water towers with lead ornament.

The Chairman said they had heard an exceedingly interesting paper, not only from the historical point of view, but from the practical point of view, in the way they might adopt lead to modern requirements.

Mr. R. Phenè Spiers, F.S.A., said he had had a sort of vague suspicion that the Palace of Nonsuch was one of the views Mr. Gardner would put upon the screen, and he would like to hear a little more about it, because in that room they had a paper read by Mr. Robinson many years ago, at which a view of Nonsuch was given, and he claimed that the decorative work of the palace was made in a plaster of a new kind brought over here. He would be quite willing to agree with Mr. Gardner that those panels which decorated that palace would be infinitely better in lead than in plaster, because at the time he wondered how the plaster could have been protected, for in many parts it would not have been protected by those gable roofs found in many of the houses where plaster decoration was employed. Throughout France they had the most beautiful roofs, gable ends, and finials in lead, and in fact they seemed to employ it in decoration to a much greater extent than they did in England. He also remembered seeing at Rouen in the Museum three or four finials which were made in lead. The finials were 6 ft. or 8 ft. high, and massive, and he should think when raised aloft on a gable they would have been very important features. He had also seen lead coffins made by the Romans, and he believed there were two or three of them in the Louvre with precisely the same decoration and method of casting as described by Mr. Gardner. There were three or four in the Louvre brought by M. Ernest Renan from Syria. He had, of course, seen the bridge across the street joining up the Grand Hotel, but did not know that it had ever occurred to him that it was anything else but stone, but it was a very graceful little structure and well decorated, and it was extremely interesting to know that such a feature could be produced in lead. If the result of Mr. Gardner's paper was to induce some architects to employ lead to a greater extent than it had been, and to revive an old manufacture, then Mr. Gardner could not regret the time and labour he had given to the preparation of his paper. He moved a hearty vote of thanks to Mr. Gardner, who had, he knew, devoted many years of thought to the subject, and as to the way the manufacture of lead could be brought into greater prominence. He was sure they were all much obliged to Mr. Gardner for coming there and illustrating his remarks in the admirable way he had.

Mr. Ernest George seconded the motion.

Mr. Maurice B. Adams asked how large Mr. Gardner thought the sheets of cast lead could properly be made supposing they were to erect such buildings as had been suggested? He did not think the suggestion with regard to commercial buildings was at all a bad one, because it was becoming a matter of some difficulty with increasing voids as to how the façade could be adequately treated. In the application of lead, however, the size of the sheets of lead had always been a matter of some difficulty. What was generally done was to nail it up by the top edge, and welt or roll it together, one sheet over the other, and when the sheet was very long fix some sort of iron holdfast to help hold it up, leaving the sheet of metal free of course, for the purpose of expansion and contraction. It occurred to him that it might be useful if Mr. Gardner could tell them whether he had had any experience—possibly he might have had something to do with the bridge at the Grand Hotel—as to how large these sheets should be. Assuming that they were enriched with ornamentation, some parts would be rather heavy, and would require some special fixing, and although they could, as the illustrations had shown, have pilasters to cover the joints of two sheets, one would like to know how large these metal casings could be reasonably made, and which was the best way to fix them. He could not quite follow how that was to be done, and it was a practical question one would like to have answered, as it was probable that others present would have realised the same difficulty. Then Mr. Gardner had not told them how it was that they got the black colour in the lead manufactured of late years. Although silver had gone down in value very much, yet the manufacturers seemed to take out all the silver and arsenic from the lead, so that it did not assume that white and silvery colour which made the old spires of Long Sutton and other places look so charming. The lead thus desilverised had a horrible black colour which appeared to him to be contrary to all artistic sense. He was rather interested to hear that the old statues, which they so much admired for their silvery colour, were originally picked out in colour and painted over, and he could not help feeling that they must look much better as they were now. It would be difficult to imagine anything more incongruous than old statues thus dressed out with barbaric splendour. He would like to know whether we could get instead of the ordinary lead of commerce pure lead with the silver left in it; whether there was any manufactory where lead in its genuine form could be purchased, and whether it was much dearer than the ordinary lead? As to the artistic treatment of lead, that must vary with people's taste, but he felt they should try to get out of the mechanical way in which they applied all materials. If they looked at the old spires and the old roofings, they would see how irregularly they were spaced, and, instead of having a ridge to give a uniform line, the rolls were carried out right up to the ridge and allowed to break the ridge line. He was aware that the wind pressure was a very great difficulty with these sheets of lead, and he understood that Lord Grimthorpe got rather into a difficulty with lead with regard to St.



Lock Buildings, Machnower, Charlottenburg. Herr F. Lahrs, Architect.

(*From the* "Berliner-Architekturwelt").

Albans Abbey because of the creeping of the lead, and, as a matter of fact, it all had to be done over again. It must have been a very great difficulty when the old builders built those immense spires like the one over St. Paul's Cathedral which was burned down long before the Great Fire, which went up, he believed, 520 ft. above the ground, and was covered entirely with lead. The wind pressure on these old spires must have been something tremendous, and the way in which the lead was fixed down was a matter of extreme interest.

Mr. W. H. Seth-Smith said they had listened with much pleasure to such an eminent authority on the subject of metal work, and it was extremely interesting to have his experience and his taste to guide them, and they hoped the suggestions Mr. Gardner had made might be made use of by at least their younger architects. As to what Mr. Adams had said as to the colour of lead, he had noticed it himself, and he sympathised with Mr. Adams thoroughly. The result of a lead-covered facia was most unsatisfactory, owing to the way in which the lead appeared to be prepared now. He was lately in Frankfort, and was noticing in old buildings there what the effect of the lead lacework on the gables was. Nothing could be more beautiful than the fine line given by that lead work, with all its rich details. He also passed a building in London the other day—he believed it was a Sailors' Institute in the East India Dock-road, or just by there—in which lead appeared to have been freely made use of, and it was very charming indeed. It was introduced in panels in front over the main entrance. There were other points which Mr. Gardner did not mention, but which he undoubtedly had in his mind—that was the great use made of lead in sundials and in the balustrades of the staircases, which were so very charming in London, and which they would have liked to have had some views of.

Mr. E. W. Hudson said that if they used lead for a fountain in a public place they would run the risk of losing the decorated part by the juveniles, if not by thieves, and therefore the application of lead to a high building like a water tower would be of particular interest. He was interested to hear Mr. Gardner bring in the instance of the Tower of St. John's Priory, Clerkenwell. He had often wondered what Stowe's description actually referred to when he spoke of the "graven, gilt, and enamelled panel." He did not know whether there was any authority for actually claiming it in metal, but it would be interesting to know whether or not it was so. They all remembered the application of lead to statuary, and would remember the negro boy which used to stand in St. Clement's-inn. He did not know whether it was there now. They also knew in the Middle Ages lead was considerably used for images and saints, and so on.

The Chairman said he was sure that some of the illustrations must have made them regret very much that they had not now in London anything so charming and picturesque as the view they had been given of Goldsmith's-row, Cheapside. With regard to what Mr. Adams said as to the colour of lead, he thought there was no possible doubt that the lead they got now and what they used for their roofs was a very different material from that used 200 years ago. As to Mr. Gardner's remarks on putting up erections of perishable material and covering them with imperishable material such as lead, he was not quite sure whether the effect of that covering would be quite so permanent as some people would think, because it had been his experience, sometimes, in treating old houses where there had been a timber turret which had been covered with lead that the lead had cracked in several places and had not been looked after, and this had let the water in, which caused the timber behind to rot in the most terrible manner. The treatment which Mr. Gardner alluded to of covering concrete and metal material with lead undoubtedly would prevent that, and seemed to be quite a feasible method. As to what Mr. Adams said as to the size of the sheets, it appeared to him that in any treatment of lead for surface decoration they must keep the panels rather small. They had all known for a long time that Mr. Gardner was one of their best artists in iron work, and it was apparent that he had not restricted his researches to that material.

Mr. Gardner, having replied to the vote of thanks, said that, with regard to the remarks of Mr. Spiers, he spent almost two days in looking over the accounts of the buildings of Nonsuch, and he thought the plaster used there was plaster of Paris, which had nothing to do with any external work; and he did not think from what he had read that any kind of plaster was known at the time which would have been available for it. Although there was some doubt about the meaning of the description, he did not think by the light of the earlier building in Goldsmith's-row there could be any doubt that the whole of the decorative work of Nonsuch was cast lead work. The account as good as stated that all the decoration of the tower and spires was lead. He had not had very large experience in lead construction, and the largest work he had had to do was the lead bridge at the Grand Hotel; there the panels were cast in sand in an open mould, and, so far as he could recollect, the size of the panels was 4 ft. by 3 ft. But there was no difficulty whatever in casting lead if they had enough hot metal and enough cauldrons to pour from. He would make a panel of 10 ft., but he would not recommend cast panels of that large size, because they would be unwieldly. Otherwise he did not think there would be any difficulty about it. There was no better way of fixing lead than by screws to iron, but of course they must be careful to give an amount of play, or otherwise it was extremely probable that with a change of temperature there would be buckling. [The Chairman: What thickness would the panels be?] They could cast a quarter of an inch thick, but where there was a good deal of ornamentation it would be thicker. [Mr. E. George: May the lead be safely put to iron?] There was no action between the metals unless there was water between them. Dry junction had no effect whatever. There was no galvanic effect going on except with water, and then only when the metals were sometimes wet and sometimes dry. The oxide was a very curious thing—that white colour which came to old lead. He could not consider that it was due to the silver because silver oxide was black, and he did not think the presence of silver could possibly affect the oxidisation of lead. Very possibly arsenic might. That was a matter he had not thought over, but he thought it would not be beyond the bounds of science to start that white oxide if necessary by the application of an oxidising agent. He should think that possibly a chemist would suggest a means of starting it just as he would start the green oxide on copper. He quite agreed that it was a great drawback to lead that it had assumed this black colour, but he expected that it would pass off with age, and become that white which they admired. The drawback to the actual joining of the joints of lead was the change of temperature. They must give it the means of contracting and expanding, and that could be done only by some kind of loose joint that was rolled over and was water-tight. The moment they burned the joints together they were bound to have buckling and trouble. He would always advocate either strips of lead to cover the joints or lapping edges one over the other in a way which would permit of movement. In reply to Mr. Hudson he would not suggest having a lead fountain, which could be kicked by children. One would always have a stone basement or something in front to hold the water, and the lead work would be behind the water, where it could not be tampered with or injured. Stowe—unless he misread him—particularly stated that the Tower of St. John's was of lead. Of course it was not really enamelled, but it had the effect of enamel; it had been painted or coloured in some way. There was no doubt the French in many cases tried to produce the effect of enamelled work on their leaden roofs. The negro which used to be in St. Clement's-inn was now in the Temple Gardens. It was one of the stock models, and there were many replicas dotted about the country. At the same time it was one of the most beautiful models.

The Chairman announced that the next meeting would be held on Monday, February 1, when the President will deliver an address to students, and some critical remarks will be submitted on the drawings sent in for this year's prizes, and at the conclusion the prizes will be presented by the President. At the same meeting an announcement will be made of the Council's nominee for the Royal Gold Medal.

DESIGN FOR CANAL LOCK BUILDINGS, MACHNOWER.

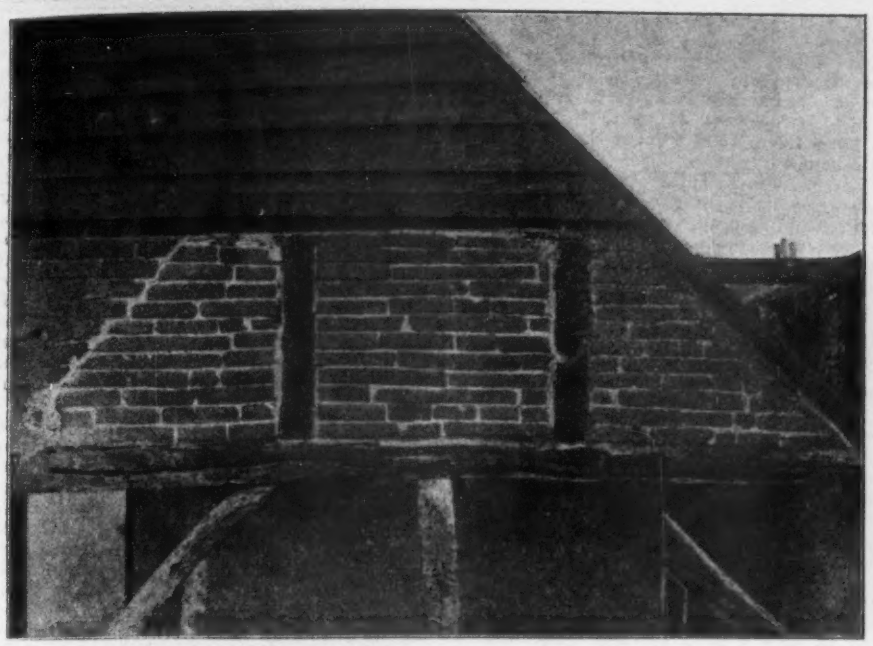
UNDER the heading "Magazines and Reviews," in our issue of January 9, we alluded to the interesting competition designs for new lock buildings on the canal at Machnower, Charlottenburg, described and illustrated in the last issue of the *Berliner-Architekturwelt*. The accompanying illustration is a slightly reduced reproduction of the perspective view of the first premiated design, by Herr F. Lahrs, of Charlottenburg, given as a chromo-lithograph in the *Architekturwelt*.

BOOKS RECEIVED.

GAUDENZIO FERRARI. By Ethel Halsey. (Geo. Bell and Sons.)

GREAT MASTERS: REPRODUCTIONS IN PHOTOGRAVURE. Part VII. (W. Heinemann.)

BRICKWORK AND MASONRY. By Charles F. Mitchell and G. A. Mitchell. (B. T. Batsford. 5s.



Part of Gable at Cobham, showing proportions of bricks.

A CURIOUS OLD COTTAGE GABLE.

THE annexed illustrations of an old cottage gable in Surrey have been kindly sent to us by Mr. A. Gower, builder, of Cobham, Surrey. The remarkable point in regard to the work is the length of the bricks, as will be seen from the larger illustration, which shows the work more in detail. Mr. Gower writes: "This unique brick gable, of which I inclose illustrations, has just been found in some old cottages that I am pulling down in Cobham. The long bricks are 21 in. by 5 in. by 2 in., and the others are cropped pieces of the same. I am removing it bodily, and it will be on exhibition in my yard. The bricks are very hard and heavy. I can give no explanation of why they were made thus, and I thought it might be of interest to you and your readers.

"I have only found two other pieces of these bricks, one 18 in. and one 12 in. long. As this portion of the gable is complete, it leads me to think the whole framing may have been filled in with them. The left-hand 4 ft. is evidently an extension at a later date, as it is a straight joint right up from the ground at the point marked with a cross."

Old Cottage Gable at Cobham, Surrey.

COUNTRY HOUSES.*

(Continued from page 55 last week.)

COUNTRY house planning presents many interesting problems, some very difficult to deal with—water supply and drainage perhaps two of the most awkward. On small sites adjoining towns, or in the suburbs, the question does not arise, as here the water is generally laid on from mains, and there is a system of drainage, but away in the country these two facts force themselves very much to the fore. Generally on most sites there are springs of water—these may be only shallow, and supplied by surface or rain water—which are intermittent, and fail periodically about October to December, the time when most water is wanted in country houses.

Sometimes we are fortunate enough to find a deep-water spring running continuously all the year round—if above our house on high ground we have a practically constant supply, and, by collecting a head of water at the spring, in a reservoir of some 5,000 or 10,000 gallons, a stand-by in case of fire. When this is the case it is a good plan to lay a 2½ in. iron main direct to the house, rising with a union and fire-hose on each floor and delivering over the cisterns in the roof with a ball valve.

By this means the full pressure of 5,000 or 10,000 gallons can be brought to bear in a minute or two to put out any outbreak, for it is only at the first onset that a fire can be dealt with, and if once it gets beyond this in a country house it is generally serious. Keep the hose permanently attached, with nozzle, etc., complete, so that the water can be turned on instantly; to merely hang it in a neat coil at the side is useless, and valuable time is lost in trying to connect it to the main.

If our spring of water is below the house, and the fall sufficient, then a ram can be used, or an oil or hot-air engine, or a motor from the electric lighting plant, if there is one, and we are on flat ground. If there are no springs we are thrown back upon wells, and these again are of two kinds—surface and deep-water wells. The latter, of course, are preferable, as they are generally constant, of good quality, and need only a lift pump to force the water to the cisterns in the roof. There is a prejudice against surface water wells, and in many cases rightly so. In small towns and villages, where the soil is porous, and where there is no system of drainage and the whole ground is saturated with impurities, they are undoubtedly dangerous to health; but where no other supply is possible, and there is no chance of any contamination, there is no objection to their use. Surface wells are those fed by rain water, pumped by an ordinary pump, and if the top 12 ft. or 14 ft., or even less, is lined with brick-work in cement to keep out any impurities from soaking in, without being filtered by passing through the ground around, then these wells are quite safe. Of course they should be near no soil or other drains, and, if possible, above them, so that there is no chance of any contamination by gravitation.

Surface wells have the same objection as shallow springs, in that they fail in dry seasons, so that where this is likely the rain water should be stored. Rain water is so useful in every way, for garden and stables, as well as the house, that it should be collected and filtered. Where the water is at all hard, or likely to choke and fur the pipes, rain water is a most valuable asset, and if a supplementary tank in the roof is arranged to supply the hot water circulation, and draw off, say, in the housemaid's closet, for use in the bedrooms, it will be found of the greatest service.

There are various water softeners on the market, but none to my mind satisfactory for working a small house. None are automatic in their action, and all depend upon constant attendance and supervision, neglect of which puts them out of order. This, however, is a matter that has to be treated specially, but it is a question that continually arises in the country.

At the outset the water should always be analysed, so that provision can be made for any possible storage or filtering tanks.

Drainage generally cannot be treated too simply, and though this is not the place to deal in detail with such matters, yet there are a few points to be emphasised. As much as possible the rain water should be kept separate from the soil drains. If in one and the same system, apart from wasting the rain water, we have, especially in seasons like the past two years, such an enormous quantity of foul overflow water to deal with, that it becomes a most serious difficulty. The ordinary overflow from a cesspool can generally be dealt with, but when this becomes diluted with a large quantity of rain water it is a different matter, besides rendering the contents of the cesspool useless for gardening or other purposes.

Genuine old English cottages and houses invariably add a charm and beauty to the landscape, as the old builders, by force of circumstances, were compelled to use the local materials, and what is native to the neighbourhood fits in most appropriately with the scenery.

The very simplicity of the builders of the seventeenth and eighteenth centuries saved them from flagrant mistakes. They made direct for comfort and convenience without troubling overmuch about ornament, and where these are there can be little real ugliness. Their work was the result of evolution, growing out of the wants which the builders had to satisfy, and of the natural material at their command. I think sufficient stress cannot be laid upon the fact that it was the being compelled to use only the materials to hand that made old work so restful, and that modern building suffers through our not being sufficiently self-reliant in the use of the materials of the districts we are building in. It is the present-day taste for cheap ornamentation and pretentiousness, and the importation of strange features that spoils so many houses, the bringing of the jarring notes of town life into the peace and simplicity of the country. There are very few country districts in England that do not contain even to-day much excellent local material, either stone or brick, chalk or flint, and if, before deciding the materials of our house, a careful search were made and inquiries instituted about them, one's work would not only be better, but much more appropriate to its surroundings.

There is no need, because a railway line will bring bricks and the slates within a mile or two of your new house, to use those materials. As architects, we should try to foster and encourage all local industries and trades, for it is better to build with the same materials that have been used for centuries than with those out of harmony with the district. Years ago, and to some extent even to-day, one could tell by glancing at the buildings not only what were the local materials, but almost in what part of England you were in. Each district was stamped with its special characteristics, not of style and date, but of material. The admirable way which the Kent and Surrey builders used the tiles for roofs and wall hanging always excites our admiration; in Norfolk, where we get brick and flint buildings with pantile roofs, the latter interspersed with diapers and patterns of glazed tiles; in Berkshire and the brick districts of the Thames valley

* A paper read before the Liverpool Architectural Society, on January 4, by Mr. E. Guy Dawber, F.R.I.B.A.

how characteristic are the simple yet dignified houses with the red walls and white windows; then the stone districts of Gloucestershire and the Midlands, the timber buildings of Cheshire and Lancashire, all speak eloquently in their own particular vernacular a language not to be mistaken or confused with the work of any other part of the country. To-day all this delightful tradition seems to be abandoned, and we use all sorts of materials, regardless of their appropriateness, in every part of the country—green Westmorland slates in Kent, red tile hanging in the heart of stone districts, and stone houses in the centre of brick ones. Consequently, like everything else, there is a spirit of unrestfulness pervading much of the country house architecture, and it does not seem to fit its surroundings, and looks uncomfortable and out of place.

Many will say this is altogether an absurd view to take—to limit the materials of a building to those obtainable in the vicinity, but I feel that, in face of the fact that such beautiful work has been done in the past with these same materials, there is no sound reason, except that of mere novelty, for the introduction of foreign ones, and to break entirely with the traditional use of the local materials seems quite unnecessary. I do not, of course, mean that we should copy and reproduce the local styles of architecture, for that is merely an archæological forgery—but we should design our new buildings in as modern a spirit as we wish, but using the materials at our command, the very fact that in so doing we shall be more or less governed by the same conditions and limitations as the old builders will give our work to-day a certain continuity of design and feeling in harmony with the old.

Before commencing to build in a new district, it is always advisable as well to study the old methods of building in the neighbourhood and to learn all you can from local builders and workmen. Much valuable knowledge will be obtained in this way, for it is surprising what shrewd and practical men some of these old country builders are, and what useful lessons in construction and the proper use of local material can be gained from them.

Architects, as a rule, do not sufficiently study the materials they are working in, and forget that details and mouldings that look well in one material do not do so in another. In the treatment of the exterior of a country house material has a great deal to do with the general effect, and if this is not studied properly, however well the house may be grouped and balanced, the final result will be disappointing. It is out of place to get a variety of materials in one house, such as brick and tile hanging, half timber work, rough cast and stone, as we should remember that in the country the texture and colour of the walls plays a far more important part than a number of features in different materials. It is the introduction of so many and various styles that makes many country houses to-day so unrestful and out of place. They should not be treated externally with nearly so much minutiæ of detail as houses in town, where narrow frontages compel us to concentrate our detail and form, so as to attract attention. In the country a breadth of treatment is absolutely essential to the repose and dignity of the whole composition, and this can never be obtained if the wall surface is broken up with ornament and unnecessary detail.

If we analyse the reason why so many old houses are so pleasing in appearance, I think you will find that it is because the builders have more or less confined themselves to the use of one material, and that this has been treated in a simple and rational way, and the detail generally kept as quiet as possible. It is the introduction of "features" that spoil the effect of many modern houses. Architects, indeed, seem afraid to leave any plain piece of wall surface without doing something to it, forgetting that in a few years time it may probably be covered by ivy or other creepers. In the country we should remember that the house continually occupies attention, and that any extravagance in detail or odd and unusual features are apt to tire and offend the eye, and therefore it is much better to keep the exterior as reposeful and inoffensive as possible, and depend for the effect almost entirely upon the proportion and grouping of the building. Of course, I do not for one moment decry beautiful detail or well-designed ornament, but it should be used sparingly, and only where its full value will be appreciated. The garden plays such an important part that it is unnecessary to spend money on the embellishment of the exterior of the house. Material, again, and its capabilities and limitations, should govern our design to a very great extent. A roof, for instance, that can be laid at a tolerably flat pitch in blue slates would be out of place in tiles.

As a rule, you should avoid too flat a pitch, which generally gives a bad proportion to a building, and is not so suitable in a country like ours, where we get much rain, sleet, and snow, that should be got rid of as quickly as possible, and with the least chance of finding its way into the house. A steep roof gives a sense of warmth and shelter that is never obtainable in a flat one. We are often pleased with the appearance of a building without knowing or troubling to inquire why; but if we come to examine the reason for our feelings I think you will invariably discover that the pitch and arrangement of the roof has most to do with it, in addition to a generous overhanging eaves. Half the charm of the old-fashioned cottages and houses, both here in England and abroad, consists in the liberal projection of eaves (a feature that is never considered by the jerry-builder). In wide overhanging eaves there is a suggestion of protection and comfort which is most pleasing. From an artist's point of view, think what a difference the shade cast by the eaves of the house on to the wall beneath makes to its beauty, emphasising and yet softening the transition from wall to room with a line of cool, grey shadow. Many houses are spoilt by consideration not being given to minor details of this kind, which just make the difference between good and bad quality of work.

In the treatment of roofs generally I think we have very much to learn from our Continental neighbours, where roofs, as a rule, are far more studied and much more marked than in this country. We treat our roofs far too severely and mechanically, and our modern methods of forming hips and valleys are absolutely destructive of any continuity of surface or texture. In the beautiful stone slate roofs of Gloucestershire and the blue slate ones of Holland and France the valleys are worked round in a wide sweep, enabling one roof to intersect another in a most charming fashion, and without any hard line of demarcation. Our modern method is to put a rigid gutter of lead, which cuts the roof up into varying planes, and destroys the feeling of one single covering that a roof should always produce. Hips again, instead of being marked by a strong and well-defined line, generally are made of tiles, kept as insignificant as possible. Abroad it is the invariable custom to point the ridge and hip tiles with a wide joint in white mortar, which emphasises the outline of the roof and acts as a contrast to its colour; and if the roof is hipped all round, the short sides are always made with a steeper pitch than the others, which prevents the roof looking flat when seen from the angle.

The chimneys have much to do with the appearance of the house, and they deserve far more attention than is generally given to them. For economy's sake they should be as few as possible, and their position well-balanced and evenly distributed over the house. Nothing so spoils the composition as a lot of small and thin chimneys coming out of the roof at unexpected places.

A well-designed chimney stack is not only useful constructionally, but if arranged at the end of a house, as you know, it gives great character and charm, and deserves much time and attention being spent on it. If building in brick, try and plan your fireplaces and flues so that the chimney stacks are solid and square; anything is better than a long flat chimney of some ten or a dozen flues and only 18 in. wide! Its effect is always poverty-stricken, and the additional brickwork in the chimneys makes them stronger and warmer, and consequently able to draw better. If building your stacks with diagonal flues never have any of the faces less than 1 ft. 10½ in.—18 in. is much too thin—and the stronger and squarer they are, the better they will look. Tall and massive chimneys, whether in brick or stone, add immensely to the beauty of a house, and perhaps no architect has realised this so thoroughly as Mr. Norman Shaw, whom I regard as a master in the art of grouping and arranging his chimneys.

The fine breadth of feeling and proportion that the old builders always attained in their chimneys is a feature much neglected in modern work.

Windows should all be of the same character, and, though it is often done, you cannot or ought not to have in the same elevation sash windows and casements, at least not in positions which bear the same relative proportion to each other Sash windows, as a rule, demand a more severe handling than casements, and where they are used a certain sense of rhythm and symmetry is essential. The fact that the proportions are vertical instead of horizontal makes them more difficult to deal with, so that a more formal design and arrangement, both in plan and elevation, should be adopted. Nothing is more unsatisfactory than sash windows of varying heights and widths scattered about the elevations, for all dignity and simplicity is lost, unless they are proportionate one to the other, and spaced more or less equi-distant apart.

There are many advantages in the sash window, its method of opening for ventilation being one, and the texture its bars and small panes give to the general surface of a building being another. Casements, of course, can be more elastically treated; indeed, they are the easiest form of window to deal with, and allow of infinite variety—in bays, oriels, or plain windows, and in either wood or stone; pulled out to a long and low window, or coupled together, and by means of transomes carried up to any height. Personally, in a country house, if lead glazing is adopted, I am averse to any coloured or painted glass, or to fanciful patterns in the leading. Here there is nothing to hide or screen, as in towns, and simple squares of clear glass, which do not shut out the green fields and trees, or clouds and blue sky, seem all that is necessary. In certain windows—perhaps in the hall or staircase—it may be desirable to have coats-of-arms or something of that sort; but let it be a feature distinct by itself, standing out conspicuously from its environment of clear glass, and not in any sense mean as a screen. Upon the balance and proportion of the windows in a house much of the beauty of its elevations depends. As a rule nowadays, windows—casements especially—are made too big and too wide, and consequently out of scale and proportion. This is due in a certain measure to the foolish building by-laws made years ago for buildings in crowded cities and towns, and which are totally inapplicable for country districts. In the country, where a far greater proportion of time is spent out of doors than in towns, the necessity for large windows is not so great, for every architect knows it is not so much the size as the position of a window that best lights a room.

Large windows, if facing north and east, make a room cold, and if facing south and west too hot.

And, bearing on this fact, it is curious that although in old houses the rooms may not by measure be larger than those of an ordinary modern house, yet they often appear more roomy, and can contain more furniture with comfort. The cause of this lies in good proportion, the rooms not being mere cubical square boxes, but wide apartments, the plans themselves being good, rooms well and effectively lit, without too much or too little window, and more particularly the various windows, fireplaces, and doors being well placed with regard to one another; it is on the attention to these points that the comfort of a house depends. If you examine and measure the windows of any thoroughly well-lighted room in an old house, you will be surprised to find how small the actual openings are and how unnecessarily big we make ours. In a measure this is perhaps attributable to the height modern rooms are made. The reaction from the low and oftentimes dark rooms of the sixteenth and seventeenth centuries set in in Queen Anne's reign to the high and lofty ones then coming into fashion. This feeling has lasted to the present day, and has done more to spoil the proportions of modern houses, both inside and out, than almost anything else. High rooms are always associated in people's minds with healthy rooms, and though this is doubtless true if the windows are taken well up to the ceiling, yet in very many cases this is not done, and there is a pocket of bad and vitiated air that cannot escape, and which produces a sense of oppression and weariness never met with in a well-ventilated room that may be much lower. Rooms above a certain height become disproportionate as regards their width and length, and unless the windows are carried close up to the ceiling, they cannot be well ventilated.

As I mentioned before, it is a great addition to a house to get one room higher than the others; the hall perhaps carried up two stories or the parlour treated as a music-room, with panelled ceiling and sides. To speak of the inside decoration or the fitments of a house in a paper of this sort is quite impossible; it is a subject in itself, and one that would occupy an evening to deal with.

Generally, the keynote to the treatment of the inside of a country house is contained in those two very hackneyed words "breadth and simplicity." Simplicity does not in any way mean "poverty" of treatment, but restraint and a certain amount of common-sense in design. A house can be fitted up with the richest and most exquisite materials, and yet be absolutely "quiet and dignified." Also it can be treated with the poorest materials, but in a manner that produces an overwhelming sense of garishness and vulgarity. Think of the arrangement often seen in an ordinary room in the country. An enormous cornice of heavy and cumbrous shape fills up the angle of the room, a large moulded picture rail, and a deep-moulded skirting of coarse and vulgar detail, entirely mar all sense of repose and scale. The skirting, for example, is put to prevent the legs of chairs and pieces of furniture, or brushes, etc., from damaging the plaster of the walls. It need be little more than a fillet some 3 in. or 4 in. high at the most, kept as plain and unobtrusive as possible, and in no sense as a decorative object. Yet tradition has handed it on as one of the essential features in a room, and to-day it is continually met with 15 in. and more in height, showing that its original object is not only absolutely forgotten, but quite misunderstood. The masses of woodwork, in the way of linings and architraves, so constantly seen around windows, again, are surely entirely out of place in the country, and, instead, if we have the plaster work taken into the window frames, without any woodwork at all, the effect is greatly enhanced.

Ornamental plaster work is a delightful method of treating walls and ceilings, and one that particularly lends itself to the decoration of country houses. If, however, it is used, it should be taken, as far as possible, throughout the whole house, even if only a touch here and there is put in some of the rooms, for the effect, however slight of a continuity of treatment, will be better than concentrating all the decoration in one elaborate room. And this indeed applies to everything in a country house—just as there should be no "back" to it—so there should be no part or room out of character with the rest. There should be a similarity of treatment throughout; one room should lead to another without any violent contrast in colour or detail, and the whole should be thought out, planned, and fitted as one scheme.

We should endeavour to plan our houses with an absence of everything that goes to make work and labour, to concentrate the various departments, and to make their working as easy as possible, and though my few remarks apply more to the houses that are generally built, and which come in our everyday work, yet what I have said is equally suitable to the costly and elaborate ones. The simpler and quieter they are kept, both inside and out, the more successful they will be, and though there is a great prejudice amongst people against any changes in our methods of living, yet I feel the force of circumstances and progress of public opinion, in the country, at any rate, is bound in time to have its effect.

Of course, in comparing old houses with modern ones, as so many people do—to the disadvantage of the latter—the fact is always overlooked that the builders of them had none of the difficulties to contend with that are ever present to-day. Drainage and sanitation were practically unknown in the way we now understand it; water supply and the consequent introduction of hot and cold pipes inside the house; electricity and heating, together with the complication of modern requirements, and the over-elaboration of planning and arrangement were all non-existent, so that when these old houses are examined in detail they are found to be both simple in plan and elevation. All these houses, too, were built, the smaller ones, at any rate, by local men, and with local materials, and there was no visible change from the houses built by fathers and their sons. Building was traditional, and any changes were the result of gradual evolution as the work went on. Houses in the same districts were always alike, and the transition in style to other places where the materials were different was gradual and not harshly marked.

All this is changed to-day, and new houses are built, often closely contiguous, of different materials, and in widely varying styles, producing a violent contrast of effect and a jarring note in the landscape, and, to my way of thinking, for no particular reason. Building nowadays is different, as there is no traditional style, and the public help themselves at will from the varied fare provided by architectural caterers, and, as a natural consequence, suffer from architectural indigestion. It rests with architects to remedy this condition of affairs, and to show in our work that it is possible to build country houses which will combine the simple beauty of bygone times with a thoroughly practical solution of the many requirements of our own day, and this I feel sure that most conscientious architects are trying their best to accomplish.

Fragments of Ancient Work found at Bermondsey.

REMAINS OF BERMONDSEY ABBEY.

A VERY interesting discovery has just taken place upon the site of the new artisans' dwellings now being erected by Messrs. James Smith and Son for the South-Eastern Railway Company, under the direction of Messrs. Humphreys, Davies, and Co., architects, at the corner of Abbey-street and Tower Bridge-road, Bermondsey. During the excavation for the basement to the third block, coming away from the church gates, upon which site formerly stood the Curriers' Arms publichouse, the workmen came across two limestone coffins containing human remains. Great care was taken so as not to disturb anything that might be a historical feature, and the soil was removed without damage to the skeletons or coffins, and we were able to take photographs. One skeleton was that of an aged man with head lying on one side, probably deformed, as he had curvature of the spine. The other was at first thought to be that of a woman by the shape of the pelvis, but after examination by Dr. Fox and Dr. Smart it was decided that it was undoubtedly that of a younger man. The coffins were found about 10 ft. deep below the ground level, and were placed upon the gravel bed. They had no lids, and were filled up with sand, which had evidently helped to preserve the bodies. A third coffin was found about 8 ft. away, but was demolished by the workmen before investigation. The bodies were evidently those of persons of high rank connected with the ancient Bermondsey Abbey. Most probably they were abbots, as other remains were found in the vicinity, but without coffins, and which evidently were ordinary monks. Records show the site to be that of the burial-ground connected with the abbey, the only portion of which remaining is the portion of the East Gate House, situated in Grange Walk. It was originally a Cluniac monastery, founded in the eleventh century; the first prior, Peter Osbern, was appointed in 1089; he died June 10, 1119. In 1390 it was made an abbey, and John Attelborgh was created first abbot by Pope Boniface IX. The last abbot was Robert Wharton, who surrendered the abbey to King Henry VIII., who dismantled it on January 1, 1537, for which Wharton obtained a pension of 333*l.* 6s. 8d., and in addition the Bishopric of St. Asaph. The first rector was John de Ecclesia. Since then there have been fifty-seven; the present one is the Rev. Henry Lewis.

There have been found also on the site during the excavations a number of moulded stones of different periods connected with the abbey (some of which are shown in the accompanying photograph), and also the principal foundations.

They have been traced and placed on record by the London County Council.

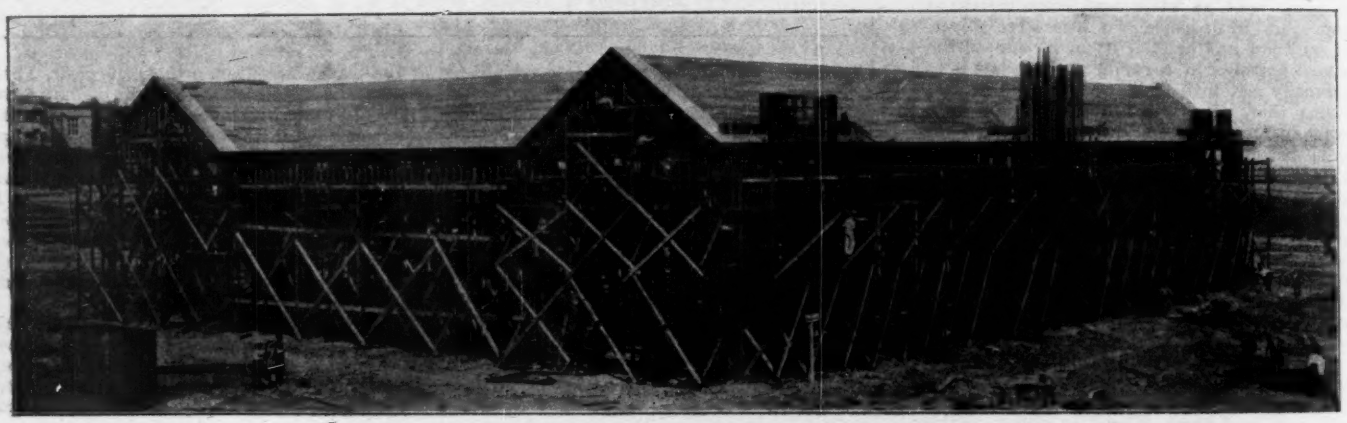
JOHN VAUSE,
Clerk of Works.

ARCHITECTURAL SOCIETIES.

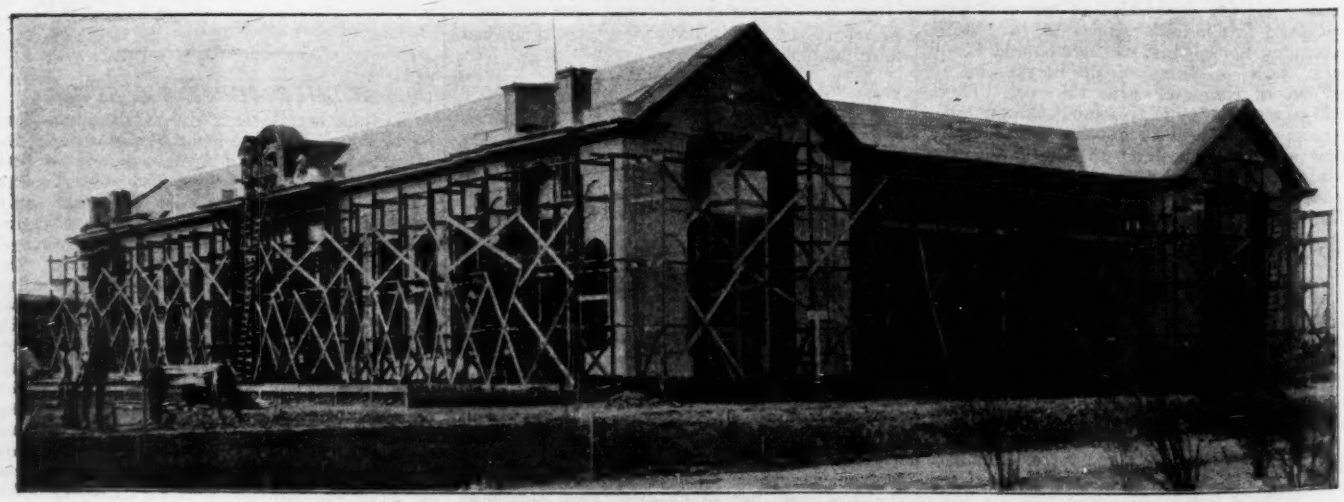
MANCHESTER SOCIETY OF ARCHITECTS.—Professor Beresford Pite addressed a meeting of the Manchester Society of Architects on the 14th inst. on the subject of the registration of architects. Mr. Charles Heathcote was in the chair. Professor Pite discussed the Architects' Registration Bill, promoted in the last session of Parliament and dropped, as indicating the programme proposed for registration. The bill would operate by examination. It was, however, only the scientific part of an architect's professional education which could be tested by examination, and this he held in common with others engaged in building—with engineers or builders—and any partial legislation applying only to architects and excluding other builders would be impolitic. The artistic qualifications of the architect were discussed at length, and it was pointed out that these are quite indefinite and incapable of test by examination. His peculiar qualification is that he designs, and this special quality, Professor Pite held, is that which cannot be tested by examination. Therefore a bill to establish a qualification of architects by examination must fail in effecting its purpose.

BRISTOL SOCIETY OF ARCHITECTS.—The ordinary monthly meeting of this Society was held at the Fine Arts Academy, Clifton, on Monday, the 11th inst., Mr. Joseph Wood, President, in the chair. After the routine business, including the election of three new members, a paper was read by Mr. Harrison Townsend on "Pictorial Mosaics." The lecture started with a description of the earliest examples of Christian mosaic handed down to us from the 4th century. The basilicas erected by Constantine were extensively decorated with mosaic, and those in the Church of Sta. Costanza at Rome were particularly interesting, showing, as they did, distinct pagan influence. The fragment of mosaic, apparently of this century,

Aspect of Site on August 22, 1903.



October 2, 1903.



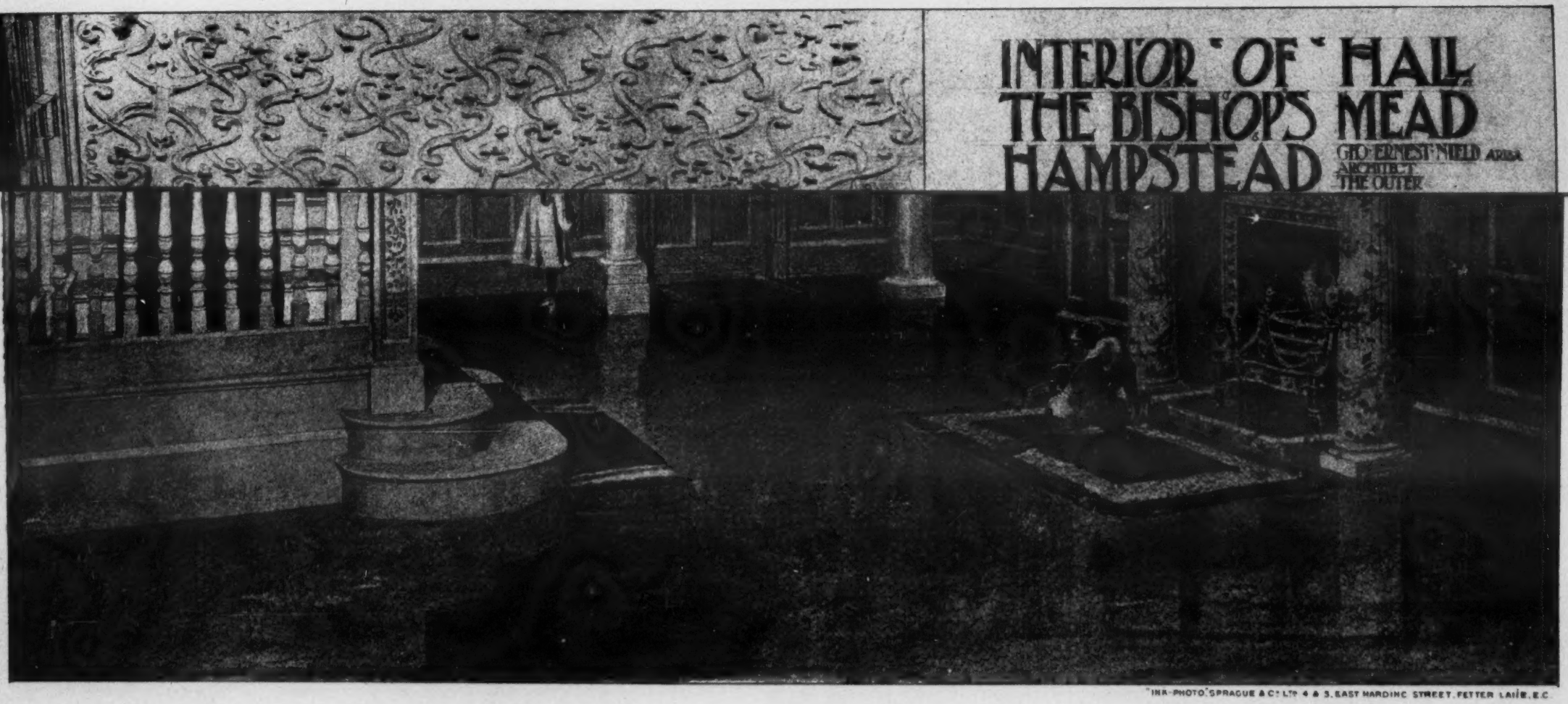
October 15, 1903.

A Rapid Piece of Work:—Illustrations of the Progress of the English Pavilion at the St. Louis Exhibition.

found in the cemetery of S. Callisto at Rome, and now in the Vatican, was interesting as being the earliest representation of the traditional face of Christ. It was in the early years of the 5th century, A.D. 402, that Honorius shifted the seat of Empire to the bare marshlands of Ravenna. Ravenna owed to the Empress Galla, of Placadia, the widow of Constantine II., three of its treasures, the Baptistry of the Orthodox, the Chapel of the Archbishop, and the mausoleum of the Empress herself. The central panel of the act of baptism in the baptistry showed that pagan symbols and tradition still lingered, the figure representing the River Jordan as a typical Roman river god holding the traditional urn whence gushes forth the stream. At Rome highly important work was executed in this century; the mosaics on the Triumphal Arch of Sta. Maria Maggiore showed the Annunciation, the Presentation, the Three Magi, the Dispute in the Temple, and the Massacre of the Innocents. Much of the mosaic work of the basilica of St. Paolo fuori le Mura was interesting in so far as it retained for us the scheme of the original mosaics of Pope Leo I. (440 to 461). The 6th century was rich in material for study in both the eastern and western portions of the Empire. In the former the building of Sta. Sophia at Constantinople, after the fire of 533, was brought to a close by Justinian in 559; the gorgeous mosaics with which this beautiful edifice was decorated had lain, for the many centuries that followed the dominance of the Crescent over the Cross, under many concealing coats of whitewash. In 551 Ravenna resumed its place as a great city of the Empire of the East, and early in the century the Baptistry of the Arians, or Sta. Maria in Cosmedin, was built. The mosaic decoration of this church, like its rival the Baptistry of the Orthodox, or St. Giovannia in Porte, started with the central subject setting forth the Baptism of Christ, a curiously close copy of the earlier example seen in the latter church. St. Apollinare Nuovo and St. Vitale were churches which both contained fine examples, and for all its sadness of decay St. Pollinare in Classe was a magnificent contribution to the history of mosaic art. Leaving Ravenna for Rome they found the art under fresh influence, due to the dominance of the northern races after the accession of Theodoric in 493, a good instance being the Church of SS. Cosma e Damiano. Further works in

INTERIOR OF HALL, THE BISHOP'S MEAD, HAMPSTEAD

GEO. ERNEST NIELD ARIBA ARCHITECT. THE OUTER



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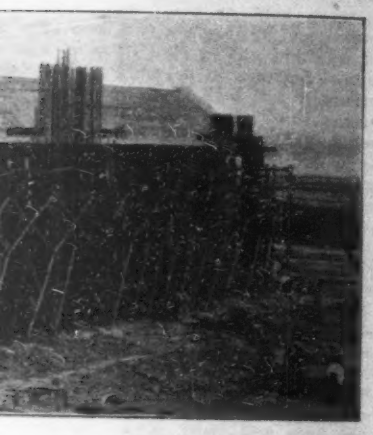

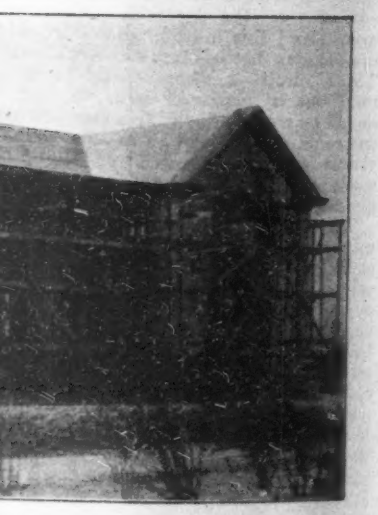

St. Louis Exhibition.

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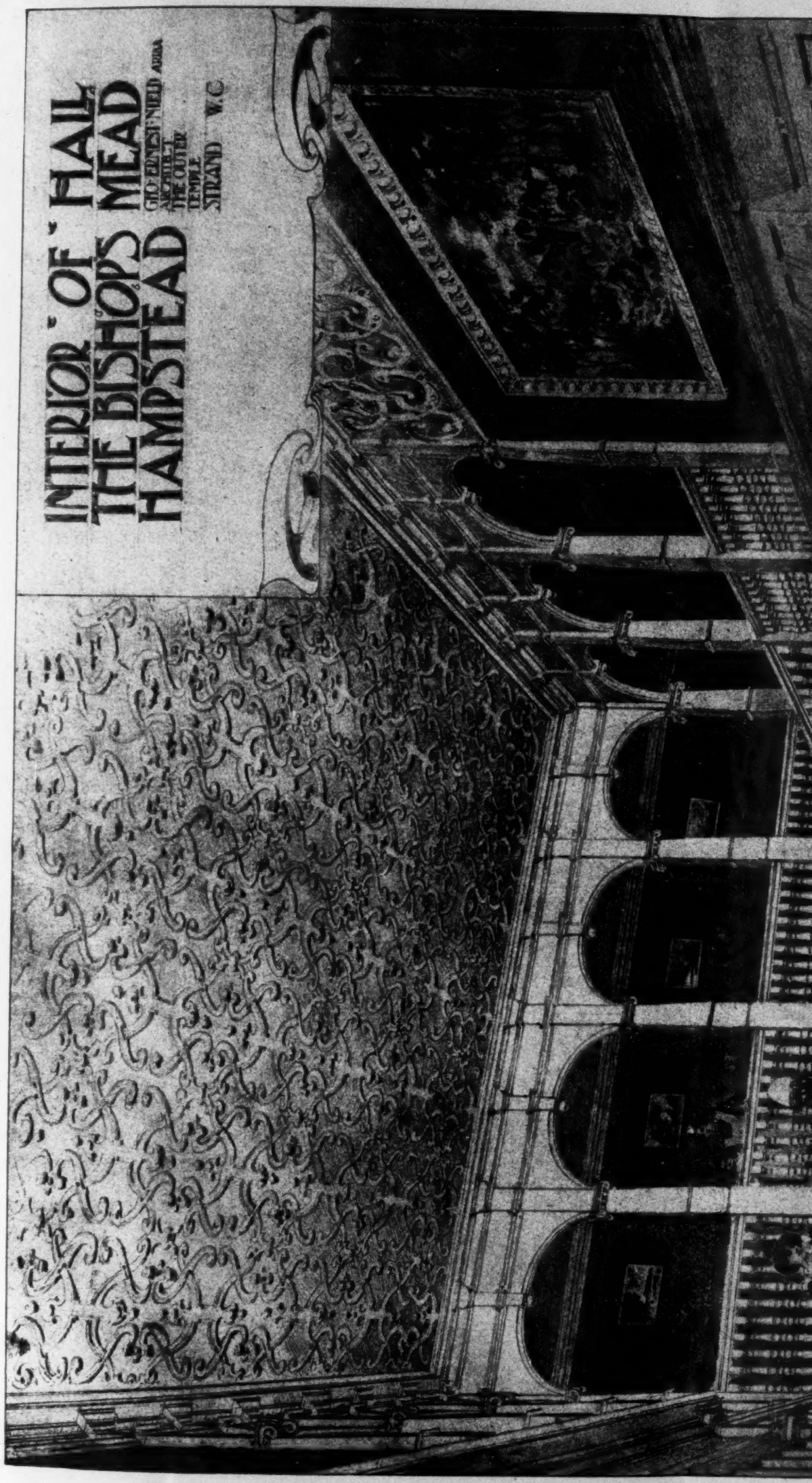

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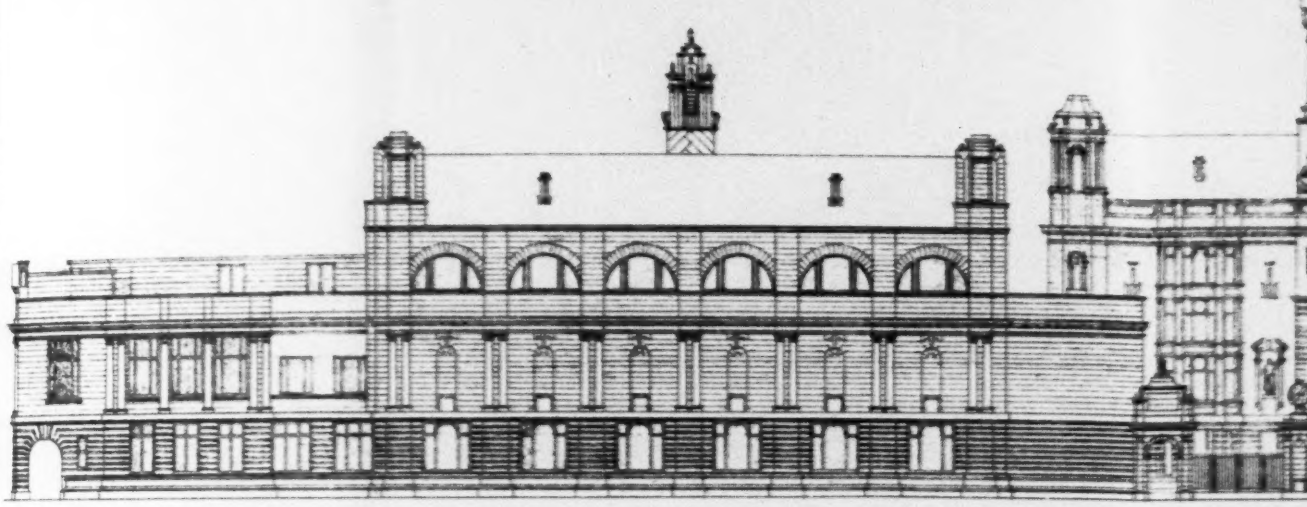

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PUBLIC HEALTH DEPT GREAT HALL

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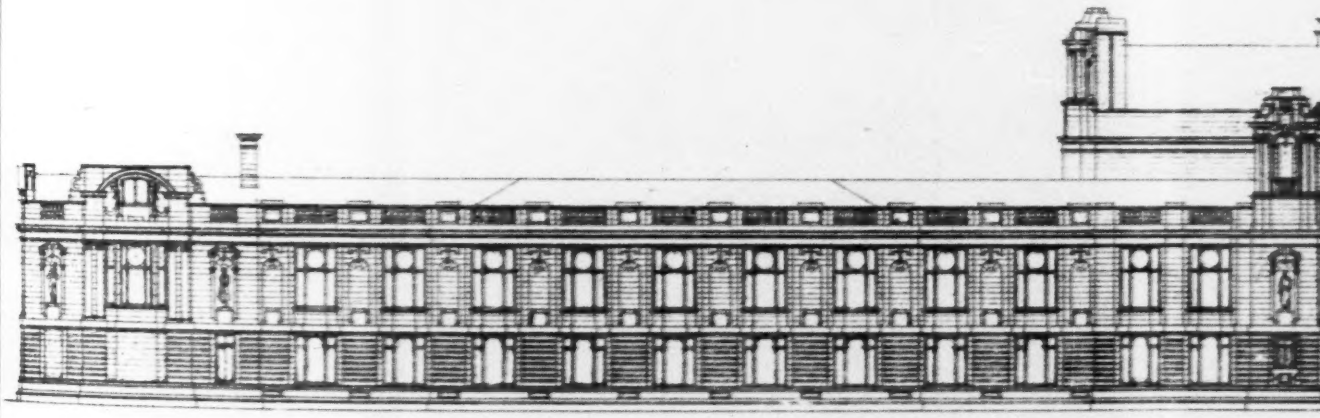
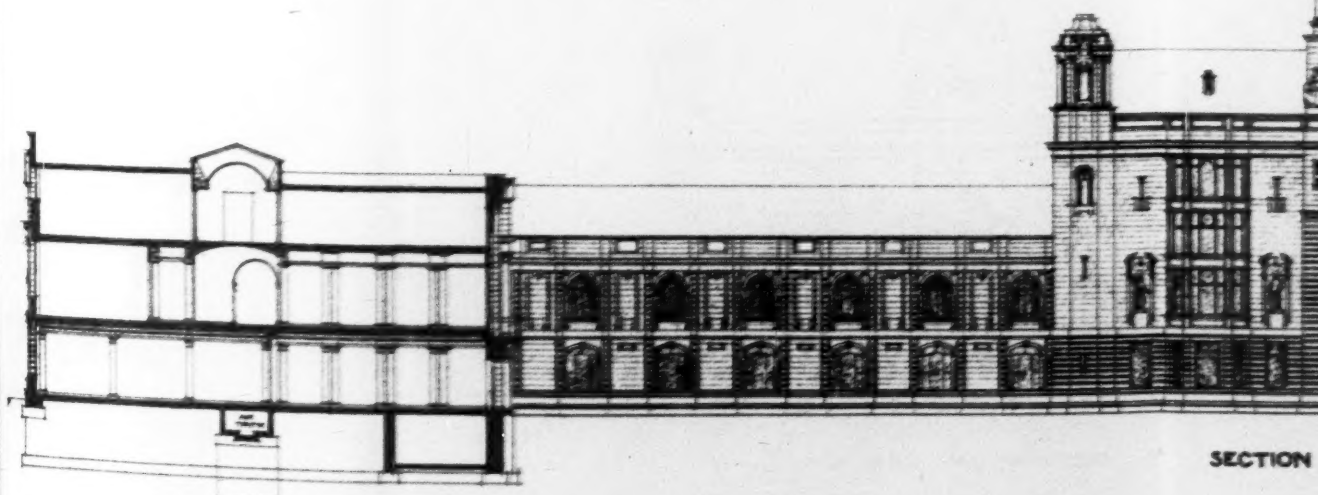


WEST ELEVATION

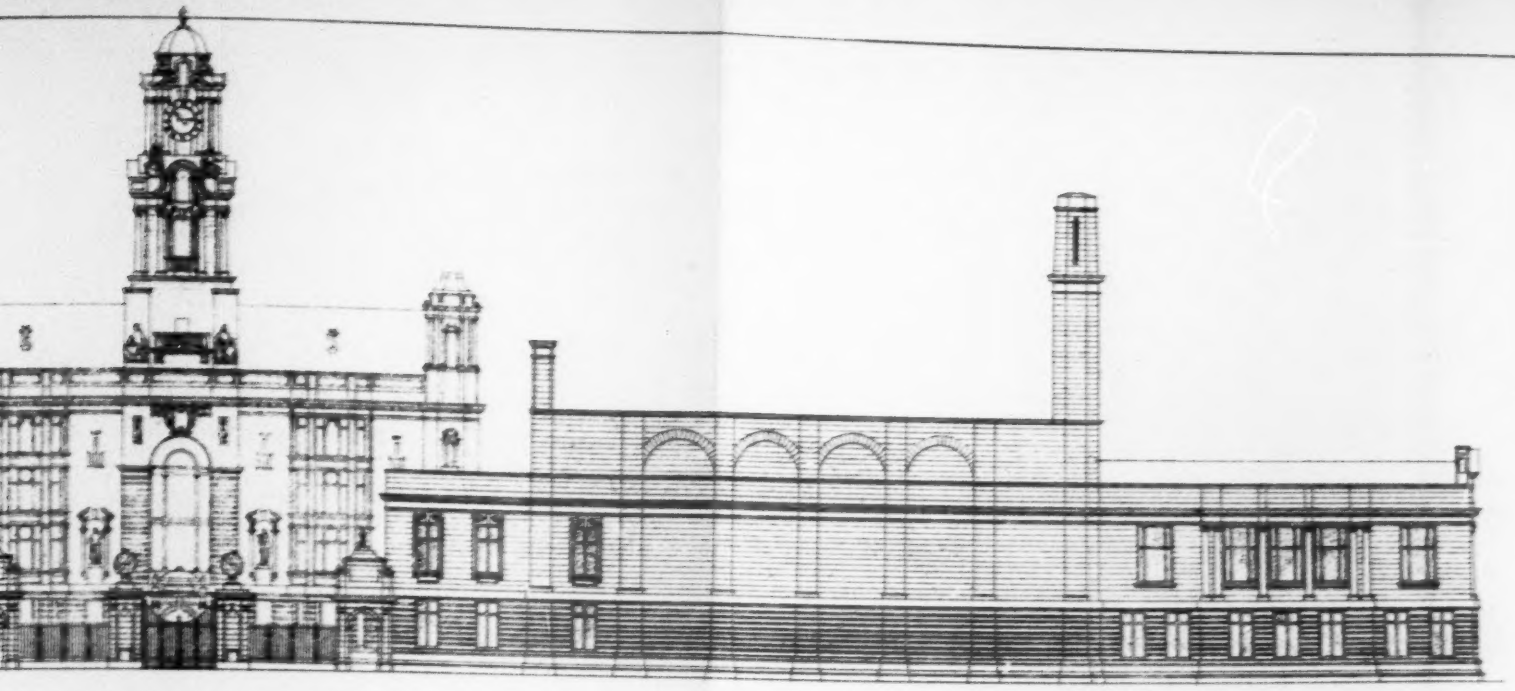
RESEARCH ADVENS NORMAL DEPARTMENT



SECTION

SOUTH BLOCK

COMPETITION DESIGN FOR SOUTH WALES UNIVE



ST ELEVATION TO PARK PLACE.

ENTRANCE

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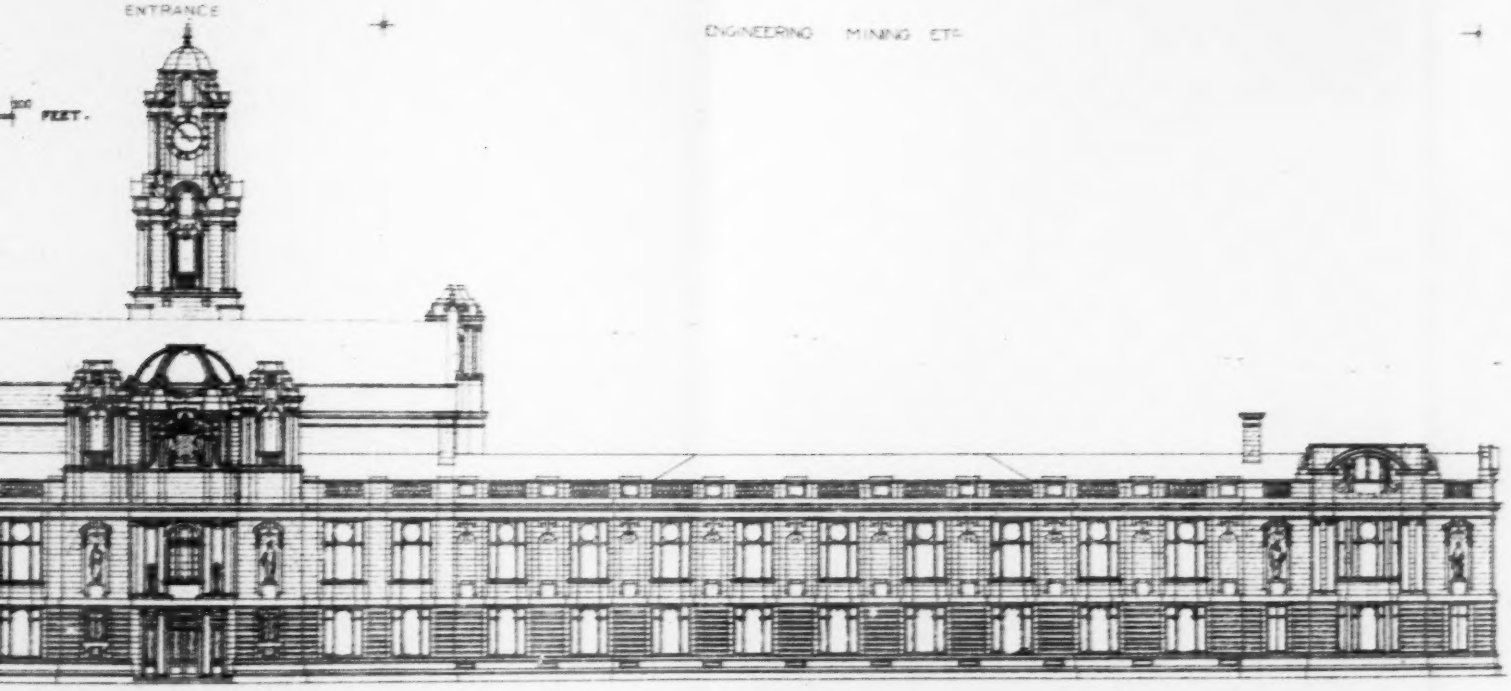

ELEVATION TO CENTRAL AVENUE

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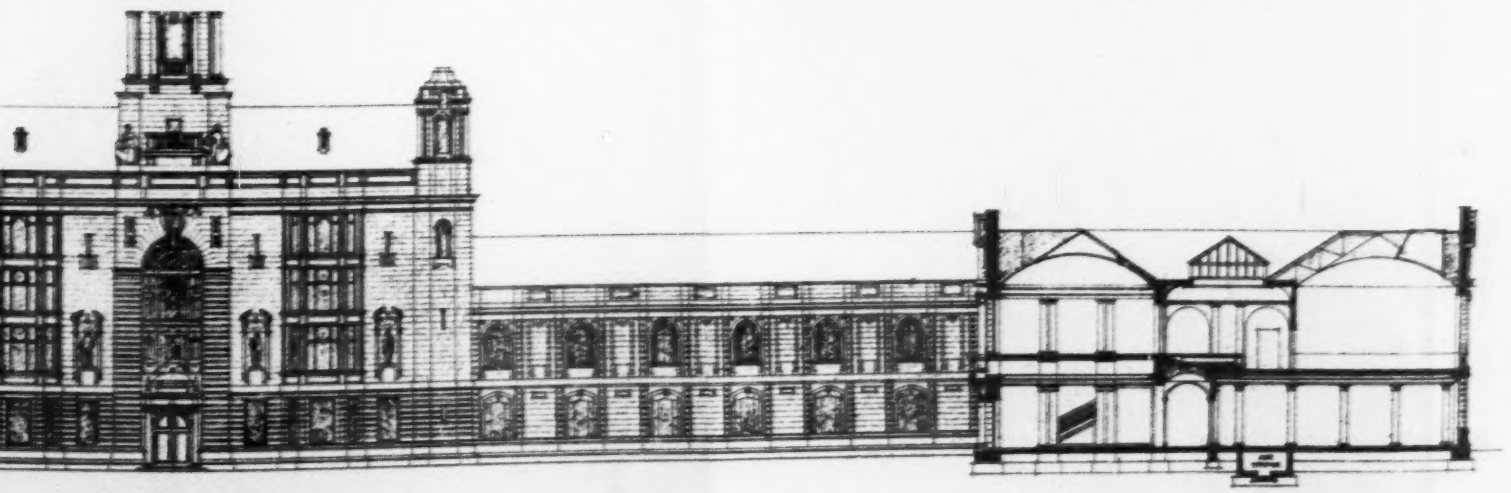

SECTION ON LINE C-D.

LIBRARY

NORTH BLOCK

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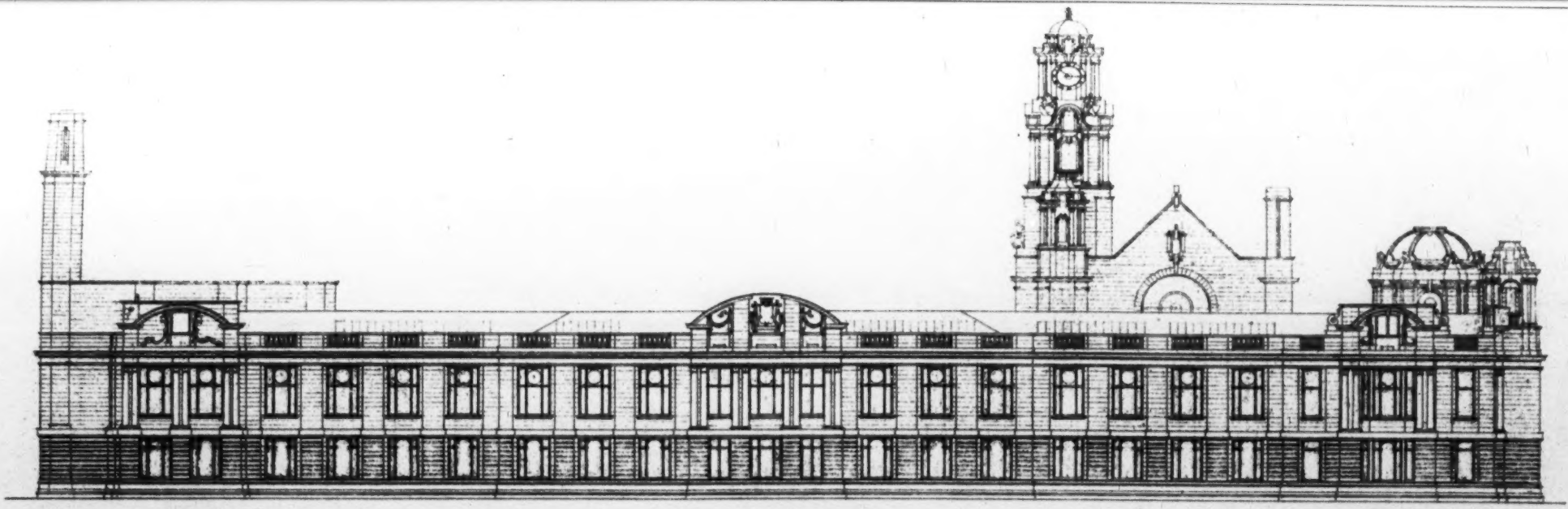
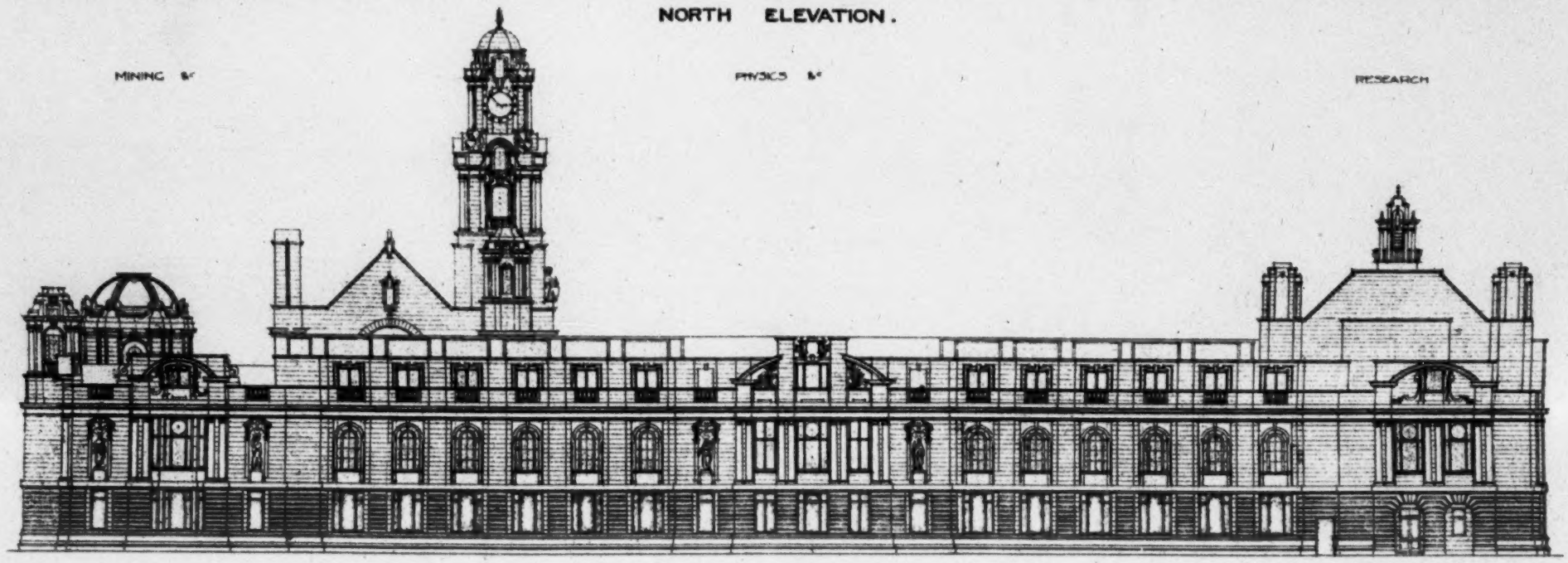
LES UNIVERSITY COLLEGE, CARDIFF.—By Mr. John Belcher, A.R.A.



NORTH ELEVATION.



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SOUTH ELEVATION.

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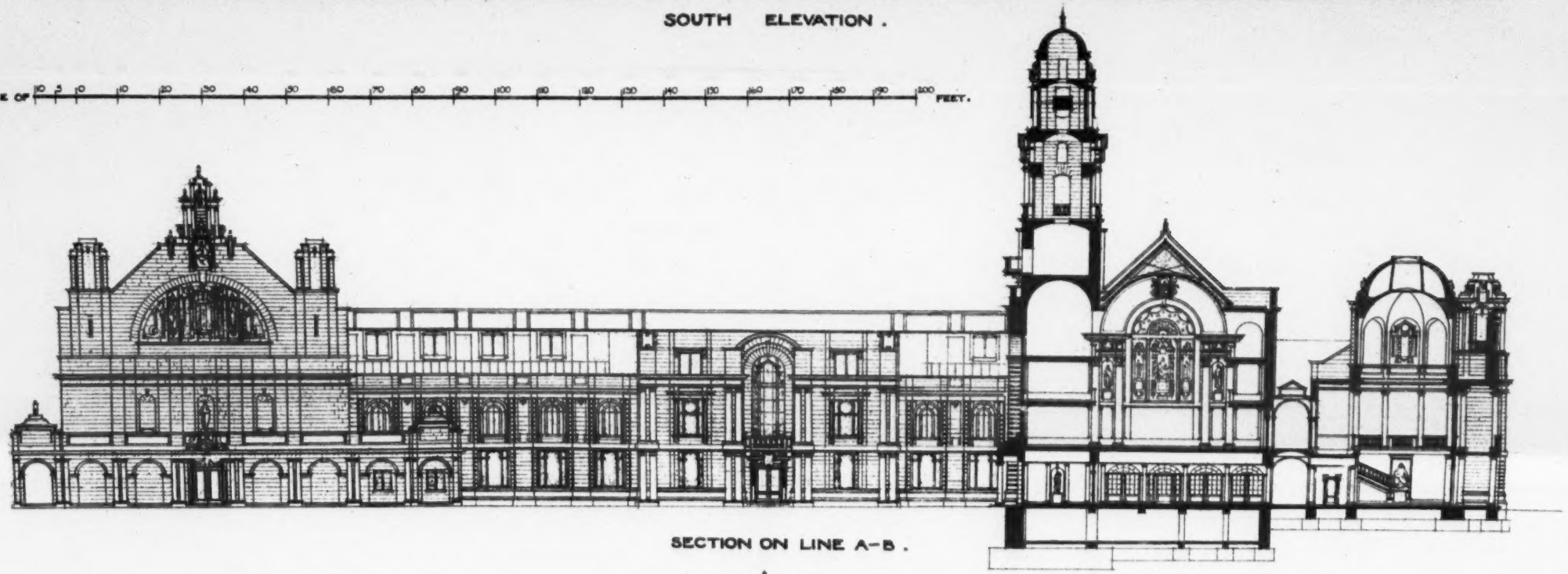

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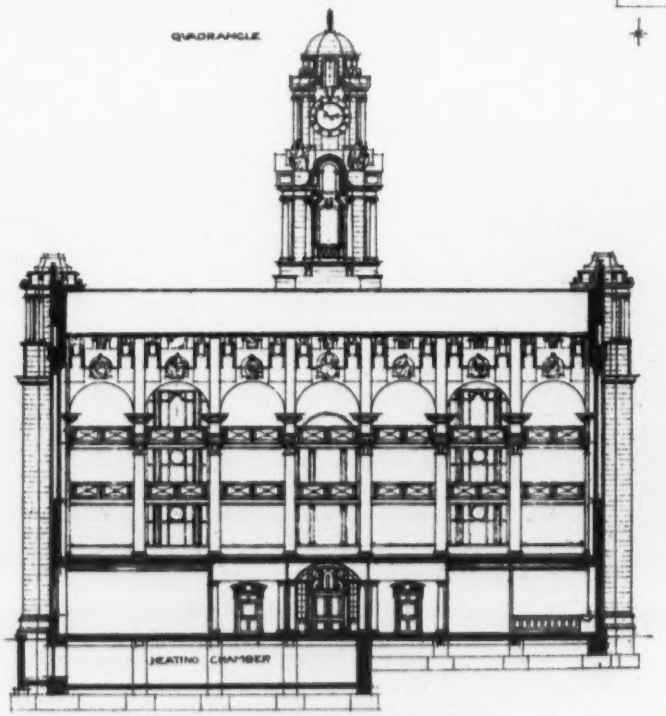

SECTION THROUGH LIBRARY E–F.

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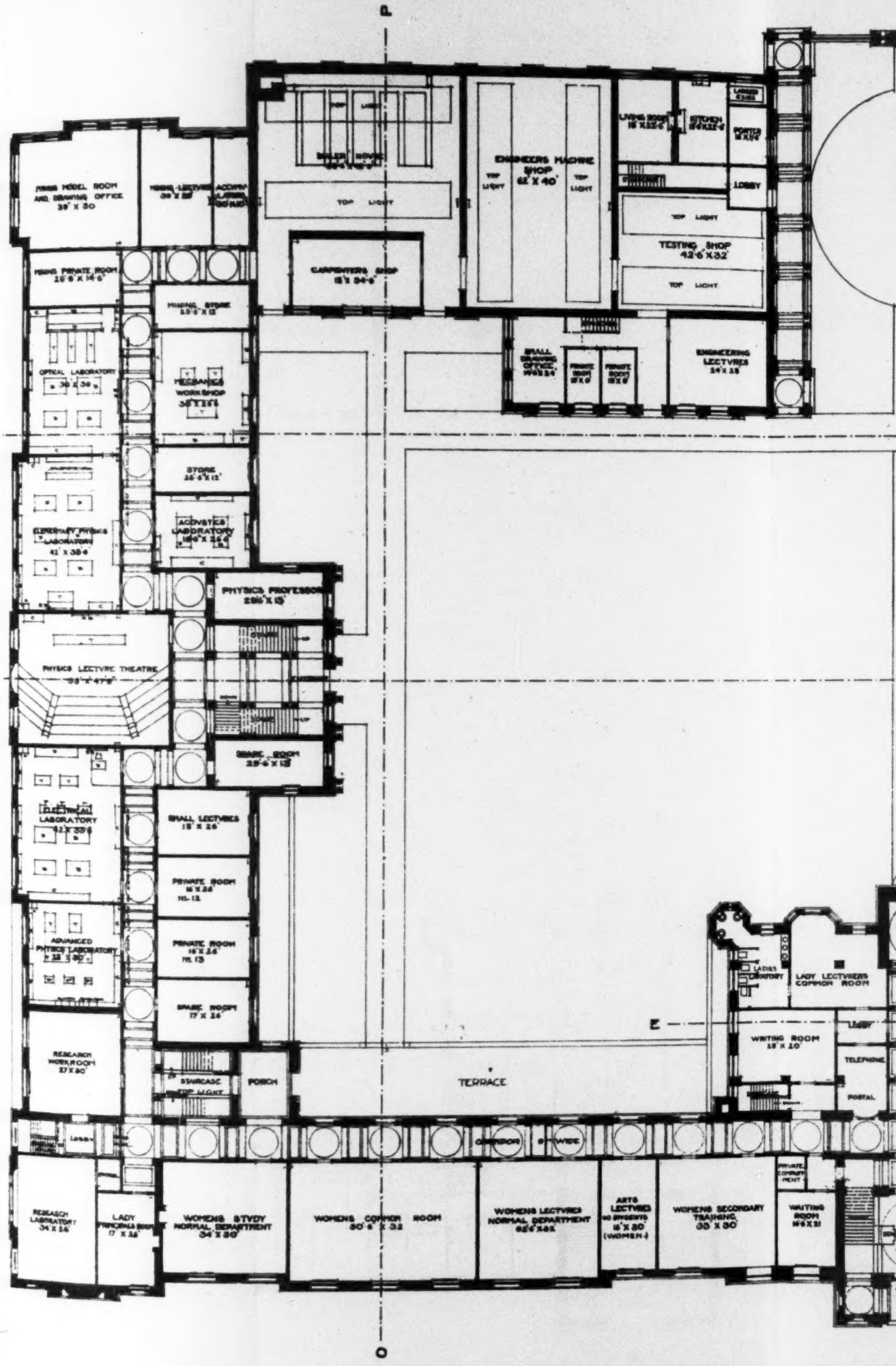
COMPETITION DESIGN FOR SOUTH WALES UNIVERSITY COLLEGE, CARDIFF.—By Mr. John Belcher, A.R.A.


MINES MODEL ROOM AND DRAWING OFFICE 39' X 30'
MINING PRIVATE ROOM 20'6" X 14'6"
MINING LECTURE ROOM 39' X 30'
MINING STORE 23'6" X 12'
OPTICAL LABORATORY 39' X 39'
MECHANICS WORK SHOP 36' X 24'
STORE 26'6" X 12'
ELEMENTARY PHYSICS LABORATORY 41' X 38'6"
ACOUSTICS LABORATORY 18'6" X 24'6"
PHYSICS PROFESSOR 29'6" X 13'
PHYSICS LECTURE THEATRE 38'-0" X 47'6"
DARK ROOM 25'-6" X 13'
ELECTRICAL LABORATORY 42' X 30'6"
SMALL LECTURES 18' X 24'
PRIVATE ROOM 16' X 24' No. 12
PRIVATE ROOM 18' X 24' No. 13
DARK ROOM 17' X 24'
ADVANCED PHYSICS LABORATORY 38' X 30'
RESEARCH WORK ROOM 27' X 30'
LADY PRINCIPAL'S ROOM 17' X 24'
RESEARCH LABORATORY 34' X 24'
WOMENS STUDY NORMAL DEPARTMENT 34' X 30'
WOMENS COMMON ROOM 50'6" X 32'
WOMENS LECTURES NORMAL DEPARTMENT 62'6" X 25'
ARTS LECTURES 40 STUDENTS 18' X 30' (WOMEN)
WOMENS SECONDARY TRAINING 35' X 30'
WAITING ROOM 16' X 31'
LADIES LAVATORY
LADY LECTURERS COMMON ROOM
WRITING ROOM 18' X 20'
TELEPHONE
POSTAL
LOBBY
PRIVATE COMMITTEE ROOM
CORRIDOR 9' WIDE
STAIRCASE
PORCH
TERRACE
TOP LIGHT
ENGINEERS MACHINE SHOP 62' X 40'
TESTING SHOP 42'6" X 32'
SMALL DRAWING OFFICE 16' X 24'
PRIVATE ROOM 18' X 8'
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ENGINEERING LECTURES 24' X 25'
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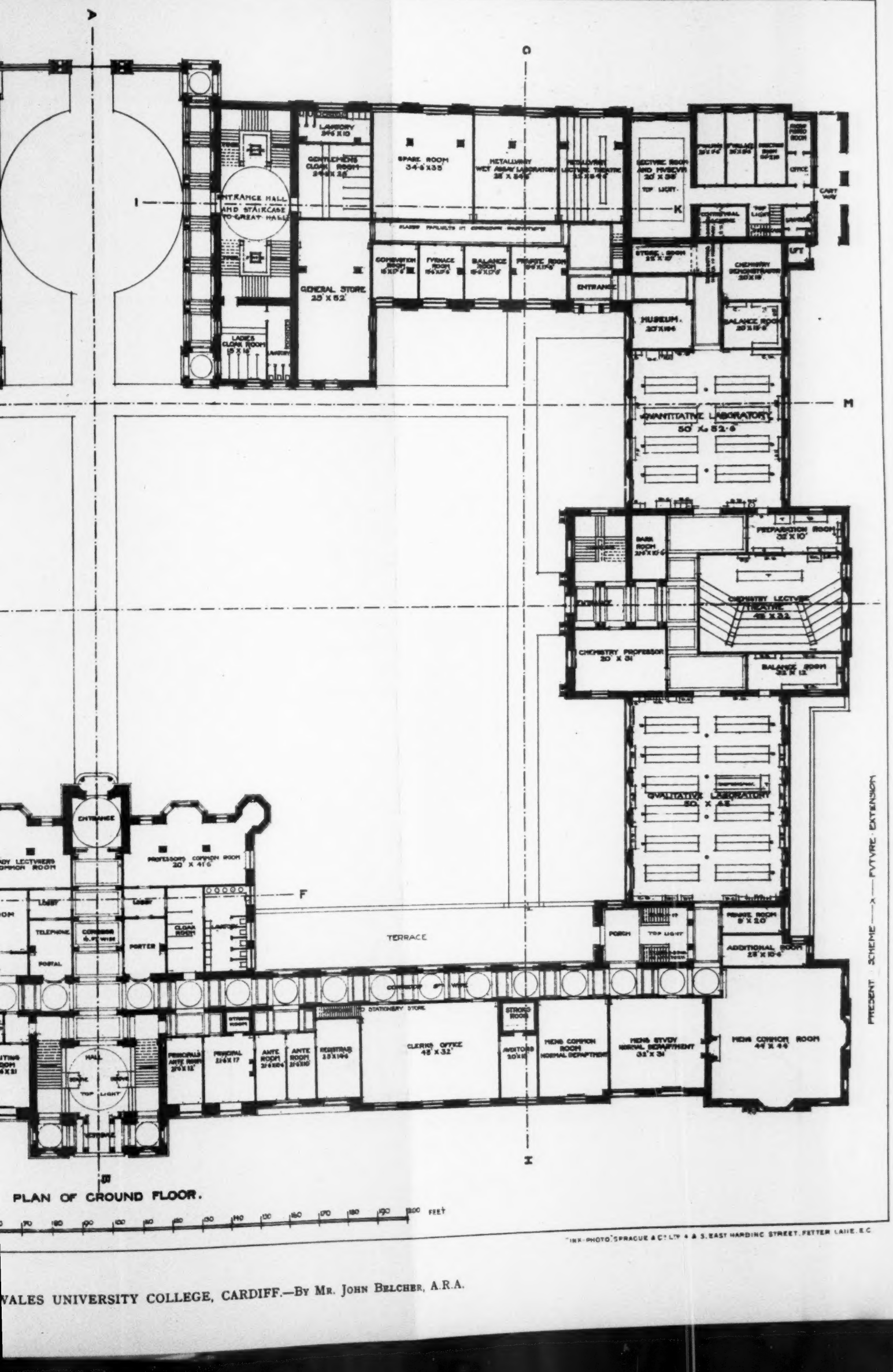

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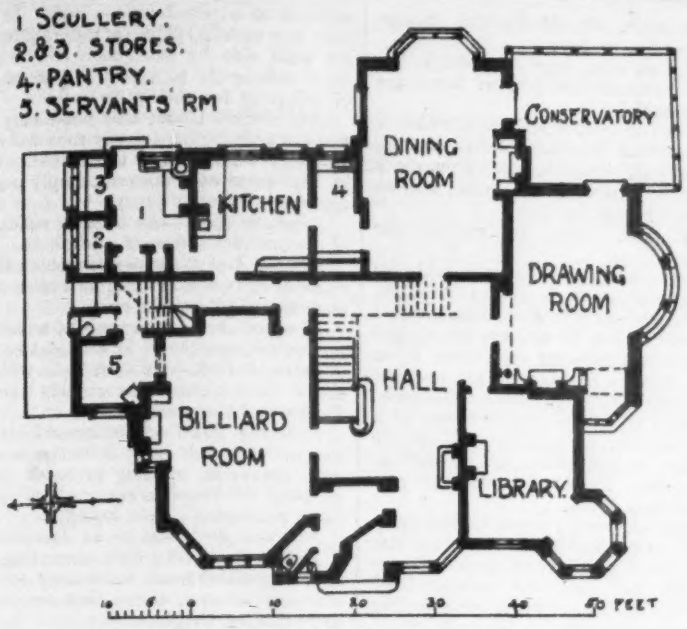

"Bishop's Mead," Hampstead. Plan.

Rome of the 6th century were the mosaics of St. Lorenzo fuori le Mura, and as samples of the 7th century work they had Sta. Agnese. This latter work reached the border line between the earlier and later styles. Thence onward the lecture dealt with the development of the art down to its ultimate decay in the 16th century, soon after which its characteristic qualities were lost in a feeble imitation of the painter's art. The really important work of the 15th century occurred in the Chapel of the Mascoli in St. Mark's, Venice. Here they saw no fatal attempts to rival the painter, such as were soon to bring about the decay and death of the mosaic art. The whole treatment was conventional, but the conventionalism not of ignorance, but of restraint, and one saw throughout the thoughtful care of the mosaist to keep his work within the limits that his material and technique demanded. The 17th and 18th centuries found the art sunk to the lowest depths, but bad as these last examples were, and full of sickly sentiment, they were in the language of their day; but for the modern 19th century work of St. Peter's at Rome not even this could be said; they merely affected the phraseology of a long past time, and in them mosaic was a dead art. The lecturer then briefly alluded to modern work in England, and some excellent examples by Mr. Anning Bell and Mr. Walter Crane were shown on the screen; the work of Burne Jones in the English church at Rome was also shown, and from these designs it was urged that we had the seeds for a revival of what, to quote Ghirlandio's opinion, was the "true painting for eternity." The lecture was profusely illustrated with lantern slides.

GLASGOW ARCHITECTURAL ASSOCIATION.—Under the auspices of the Glasgow Architectural Association a meeting was held on the 13th inst. in the Upper Hall of the Philosophical Society's rooms, Bath-street. The lecturer was Professor Beresford Pite, London. Taking as his subject "Architecture, Registered or Free," the speaker referred at some length to the Architects' Registration Bill introduced into Parliament last year and afterwards withdrawn. He considered that the proper ideal of the architect's education was that of artist and contractor combined. Any proposal to register an architect as an architect was impossible, the profession being on the face of it one requiring freedom.

THE ENGLISH PAVILION, ST. LOUIS EXHIBITION.

THE English Pavilion just completed in the grounds of the St. Louis Exhibition is practically a reproduction of the Orangery at Kew, carried out under the architectural direction of Messrs. Ernest George and Yates, and under the immediate superintendence of Mr. C. Bruce Wood, the chief engineer to Messrs. Geo. Trollope and Sons, of London.

The building has been solidly erected so that it could remain as a permanent building if required. The materials are solid timber and Portland cement upon metal lathing.

Illustrations.

HALL AND STAIRCASE, BISHOP'S MEAD, FINCHLEY.

THIS house was recently erected from the designs of Mr. G. Ernest Nield.

The perspective view shows the interior arrangement of the hall. The whole of the woodwork, including panelling, staircase, and gallery, was painted an ivory white, making a pleasant contrast to the deep crimson paper hung on the walls round the gallery.

A plan of the house is subjoined.

DESIGN FOR SOUTH WALES UNIVERSITY COLLEGE, CARDIFF.

THESE drawings illustrate one of the designs submitted in the competition for the above-named building.

The buildings are arranged round a great central quadrangle, with a view to producing a symmetrical effect. As the library was to be a special feature of the design, it was placed in the centre of the façade immediately facing the principal entrance to the quadrangle, with another entrance and grand staircase in communication from Cathays Park. The great hall on the left of the principal entrance is balanced by the large buildings of the machinery and mechanical section, and all the other departments are compactly arranged so as to be complete in themselves, at the same time allowing free inter-communication, with separate entrances from the quadrangle.

A special feature is made of the tower over the entrance to the library, which it was thought would group well with the dome and smaller towers of the Cathays Park entrance.

The building was intended to be executed in Portland stone, with fire-proof floors and roof; the roofs where seen to be covered with stone slates.

J. BELCHER.

The Student's Column.

ARCHES.—IV.

BEFORE proceeding to discuss the construction of arches in detail, it will be convenient to make clear the meanings of various terms commonly employed by writers on the subject.

The word "arch," standing alone, conveys a perfectly intelligible idea, being generally understood to imply a curved structure, composed of separate and inelastic blocks or of rigid ribs, which is able to retain its pre-ordained position when receiving extraneous support only at its two ends. In the preceding article we have seen that this result can only be attained if in addition to receiving such support the two ends are placed between abutments capable of counteracting the thrust of the arch. Further, we may mention incidentally that the arch is not necessarily a curved structure, so far as the outward form of the material is concerned.

Some complication is introduced by the prefix of adjectives to the simple generic term. We find that arches are designated in accordance with their properties, their construction, their uses or their positions in buildings or other structures, and their architectural features. They are also characterised according to the curve of the lower surface or the method adopted in describing the curve, and to the resemblance of the curve to some familiar object.

In the following definitions we have not attempted any classification, thinking the category will be more useful for purposes of reference if arranged in alphabetical order.

Basket-handle Arch.—An arch of which the intrados or profile of the under surface resembles a semi-ellipse, but consists of circular arcs tangent to each other, forming a curve flattened at the crown. The name was given owing to the resemblance of the curve to that of a wicker-basket handle, and it was assumed, apparently, that basket handles could only be of one particular shape.

Blind Arch.—An arch of which the opening is walled up. Arches are sometimes built in this way for decorative purposes, as beneath windows and cornices in cathedrals; they are also formed in the approaches of bridges, then being intended to meet structural requirements, and afterwards are *blinded* simply to close unnecessary openings.

Braced Arch.—A metal arch consisting of two ribs, or curved members, tied together and stiffened by diagonal or other bracing.

Catenarian Arch.—An arch of which the intrados is a catenary. The *Common Catenary* is the curve assumed by a chain of uniform section and material when suspended at both ends, allowed to hang freely, and loaded with its own weight only. The *Transformed Catenary*,

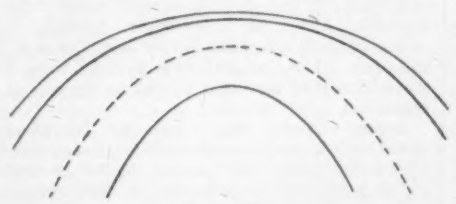

Fig. 27.

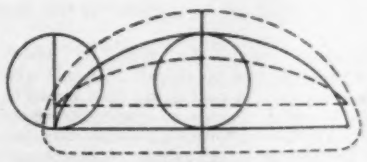

Fig. 28.

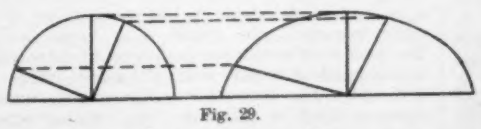

Fig. 29.

Fig. 30.

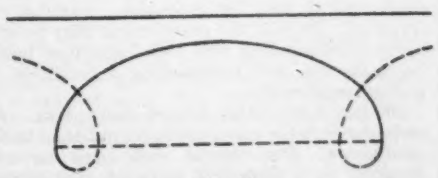

Fig. 31.

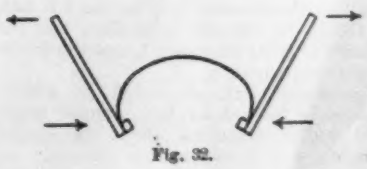

Fig. 32.

derived by parallel projection from the common catenary, is a flatter curve, the principal use of which is as a figure for arches. As the curve assumed by a hanging chain represents the diagram of bending moments for the load carried, it is evident that the same curve in an inverted form correctly represents the figure of an arch for a similar system of loading. Further, as the chain is in equilibrium, the inverted catenarian curve, when used for the intrados of an arch, is described as the *curve of equilibrium*. The *Two-nosed Catenary* is any transformed catenary in which the ratio of transformation is less than the square root of one-third ($1 \div \sqrt{3}$). In Fig. 27 are represented some examples of catenarian curves inverted. The innermost curve is a common catenary, the next is a two-nosed catenary, and the two outer curves are transformed catenaries.

Circular Arch.—An arch in which the intrados is a complete circle. For resisting uniform normal pressure from without, similar to the pressure due to the thrust of a fluid, an arch should be circular, as under such circumstances the thrust round a circular ring is the product of the pressure per unit of circumference by the radius. The term is frequently applied to arches in which the intrados is part of a circle (see also *Semi-circular* and *Segmental* arches).

Cloistered Arch.—An arch formed by the intersection of two cylindrical arches of equal rise by removing those portions of each cylinder which are above the other and exterior to their common intersection, thus forming re-entrant angles.

Clustered Arch.—A number of arched ribs springing from one column or pier.

Cycloidal Arch.—An arch in which the curve of the intrados is a cycloid—the curve generated by a point in the circumference or on the radius of a circle when the latter is rolled along a straight line. Fig. 28 shows three cycloidal curves generated from a circle, which is represented in two positions, one at the commencement and the other at the middle of its rolling course. If the point by which the curve is generated is in the circumference of the circle the result is the *cycloid proper*, indicated by the midde curve in the figure. If the generating point is within the circle the curve is a *prolate cycloid*, and if without the circle the curve is a *curtate cycloid*, the two latter curves being shown in the figure by dotted lines.

Discharge, Arch of.—Same as *Relieving Arch.*

Dome.—A hemispherical arch which may be described as a vault upon a circular plan.

Drop Arch.—An arch in which the intrados is formed by two circular arcs of equal radius described about an obtuse-angled triangle, the radius of each arc being shorter than the span of the arch.

Egg-Shaped Arch.—An arch form largely used for sewers, in which the intrados is truly *ovate*, or shaped like an egg.

Elastic Arch.—A theoretical idea, in which the arch is considered as an elastic curved beam fixed at its ends. *The theory of the elastic arch* is more particularly suited to the computation of strains in arches of metal and wood, but some types of the masonry arch are suitable subjects for calculations based on this theory. So far as essential principles are concerned there is no difference between arches of metal, wood, stone, and brick, but the nature of the materials used and the methods of construction adopted give rise to various sources of error when the theory of elasticity is applied to the masonry arch.

Elliptical Arch.—An arch in which the intrados is part of an ellipse. This is a form of arch suitable for sustaining the pressure of a mass in which a pair of conjugate thrusts at two points are uniform in amount and direction, but are not of equal value. Consequently the forces acting parallel to any given direction may be represented by parallel projections of the lines that would represent forces acting in a fluid mass. Therefore the profile of an arch intended to sustain such a system of pressures should be the parallel projection of a circle, or in other words, an ellipse. The term is commonly applied to semi-elliptical arches. Fig. 29 represents a semi-elliptical rib transformed from the semi-circular rib, at the left hand of the figure, by parallel projection, the vertical dimensions being unchanged, and the horizontal dimensions extended.

Equilateral Arch.—An arch in which the intrados is formed by two circular arches of equal radius described about an equilateral triangle.

Equilibrated Arch, or *Equilibrated Linear Arch.*—Same as *Linear Arch.*

Extradosed Arch.—An arch in which the curves of the concave and convex faces are concentric or parallel.

Flat Arch.—An arch in which the intrados is a straight line, the voussoirs being wedge-shaped or made with joggled joints. Sometimes the joints radiate to a common centre, and at others they are vertical.

Full-Centred Arch.—Same as *Semi-circular Arch.*

Geostatic Arch.—An arch of figure suitable for sustaining earth or similar vertical pressure. The curve here involved is that of a transformed *hydrostatic arch*. In Fig. 30 we have two arched ribs, the outer one, differing very little from a semi-ellipse, being a hydrostatic rib, and the inner one, differing very little from a semi-circle, being a geostatic rib. The precise figure of a geostatic rib, however, is variable, and can be transformed from a hydrostatic rib by *pulling-out* or *pushing-in*. Pulled-out geostatic ribs are sensibly elliptic.

Groined Arch.—An arch formed by the intersection of two cylindrical arches of equal rise by removing those portions of each cylinder which lie under the other and between their common intersection, thus forming a projecting angle on the concave surface of the arch.

Hinged Arch.—An arch in which hinges or articulations are provided at the springings, and sometimes also at the crown, to permit angular movement. The *two-hinged arch* is articulated at the springings, and the *three-hinged arch* at the springings and the crown.

Horseshoe Arch.—An arch in which the intrados consists of a circular arc greater than a semi-circle, or of part of an *ovate* figure, or of any other curve approximately resembling that of a horseshoe.

Hydrostatic Arch.—A theoretical arch form suitable for sustaining vertical fluid pressure proportional at every point to the depth below a given borizontal plane. In such an arch the radius of curvature is inversely proportional to the intensity of the pressure, and the complete curve is somewhat similar to a trochoid. At a certain point on each side the curve becomes vertical, and if continued each end would form a loop crossing the course of the first curve and forming a second curve at each side (as shown in Fig. 31). Theoretically, the series of arches and loops continue in endless succession. In practice, it is only possible to apply a part of the figure, generally the portion between the two points where the curve becomes vertical. A fairly accurate representation of the hydrostatic arch is given by fixing a piece of flat spring steel to two bars. Then, by pushing in the lower end of each bar and pulling out each upper end (as in Fig. 32), the spring assumes the form of a hydrostatic arch.

Hyperbolic Arch.—An arch in which the form of the intrados is based on the curve of the hyperbola.

Inverted Arch.—An arch in which the intrados is below the axis, or springing line. Also termed a *Reversed Arch*, or, shortly, an *Invert.*

Laminated Arch.—An arched rib built up of several thin plates of metal or of timber boards bent to the required curve and riveted or bolted together.

Lancet Arch.—An arch in which the intrados is formed by two circular arcs of equal radius, described about an acute-angled triangle, the radius of each arc being longer than the span of the arch. The designation is derived from the resemblance of the arch profile to the tip of a lancet.

Linear Arch.—Also termed *Equilibrated Linear Arch* and *Equilibrated Arch.*—A purely theoretical arch, the precise figure of which varies according to circumstances. If we imagine a suspended chain to be inverted without change of figure, and the direction of the load upon and of the stress in the curve to be precisely reversed, the result is a linear arch. The load then acts inwards instead of outwards, and instead of a pull along the curve there is a thrust. The curve for a linear arch under uniform load is parabolic, and under other conditions it may be catenarian, circular, or elliptical. In fact, the precise form may be any curve corresponding with the diagram of bending moments, and representing a condition of perfect equilibrium.

Oblique Arch.—Also termed *Skew Arch.* An arch of which the axis is not perpendicular to the abutments. The oblique arch may be constructed as a distorted form of symmetrical arch, or as a *ribbed oblique arch.* In the latter case symmetrical ribs to the required number are built side by side, each rib being stepped back sufficiently to afford the necessary degree of obliquity for the entire arch.

Oval Arch.—Under this head may be placed various arch forms, equally rounded at the ends and somewhat akin to the ellipse. When used in this sense oval does not imply *ovate* or true egg-shaped arches (*q.v.*).

Parabolic Arch.—An arch in which the curve of the intrados is part of a parabola.

Pointed Arch.—An arch in which the intrados consists of two arcs of equal radius intersecting over the middle of the span.

Rampant Arch.—An arch of which the abutments, or imposts, are at different levels.

Recessed Arch.—An arch built within another arch. Such arches are variously termed *Double*, *Triple*, and *Compound Arches.*

Relieving Arch.—Also termed *Arch of Discharge.* An arch built into the masonry of a wall, across an opening or weak part, for the purpose of transferring vertical pressure to parts possessing ample strength.

Reversed Arch.—Same as *Inverted Arch.*

Ribbed Arch.—An arch consisting of parallel ribs, sometimes made extra deep with shallower masonry between them, thus securing stiffness and reducing weight.

Right Arch.—See *Symmetrical Arch.* An arch of which the axis is perpendicular to the abutments.

Rigid Arch.—An arch composed of a rigid rib, usually of cast-iron or of steel, built as a deep and stiff girder, the stability of which depends upon the stiffness of the rib itself. A rigid-arched rib is generally rounded at the springings to permit a certain amount of angular motion. It then becomes a two-hinged arch. A rigid arch may also be hinged at the crown as well as at the springings. It may then be regarded as consisting of two semi-ribs, and is described as a three-hinged arch.

Segmental Arch.—An arch of which the intrados is a circular arc less than a semi-circle.

Semi-Elliptical Arch.—An arch of which the intrados is a semi-ellipse. Often described as an elliptical arch. Many arches termed "semi-elliptical" by courtesy exhibit curves that would be more correctly described as *hydrostatic* or *oval.*

Semi-Oval Arch.—An arch of which the intrados is of semi-oval form.

Skew Arch.—Same as *Oblique Arch.*

Stereostatic Arch.—The stereostatic rib is a term applied by Rankine to the most general case of an arched rib balanced by two conjugate loads. The precise shape of the rib is necessarily variable and the theorem of the stereostatic arch can only be solved approximately and after considerable labour.

Stilted Arch.—An arch of which the true impost is at a higher level than the apparent impost, or of which the piers are in reality carried higher than the apparent impost, so that a portion of the intrados on each side of the arch is vertical.

Surmounted Arch.—A stilted semi-circular arch of which the rise is greater than the radius of the circle.

Symmetrical Arch.—An arch of which the axis is perpendicular to the abutments. The term symmetrical may also be applied to the geometrical repetition of one half of an arch by the other half, but with the parts arranged in reverse order.

Three-Centred Arch.—An oval arch in which the curve of the intrados approaches that of the ellipse, and is formed by three circular arcs.

Vault.—A cylindrical arch, the cross-section of which may be of any curved geometrical figure.

HARROGATE MASTER BUILDERS' FEDERATION.—The Harrogate and District Federation of Master Builders held their annual dinner at the Wellington Hotel, Harrogate, on the 14th inst. The President (Mr. T. Raynor) occupied the chair, and was supported by the Mayor (Mr. H. Milling), Alderman Fortune, Mr. J. Turner Taylor (Town Clerk), Mr. E. Good (Hull), Mr. T. Butler Wilson (Leeds), Mr. A. A. Gibson, and Mr. E. Marshall. The toasts included "The Mayor and Corporation," which was proposed by Mr. T. Butler Wilson, and responded to by Alderman Fortune. Mr. E. Good proposed the toast of "The Federation," which was acknowledged by the President. M. R. Airton submitted "The Architects," and Mr. T. E. Marshall replied.

Correspondence.

R.I.B.A. AWARDS.

SIR,—There is one advantage possessed by those who are not serving on the Council of the Institute in that they are free to criticise the awards made. There are two instances in which I think they are not quite justified this year. In the Tite competition the prize ought to have been awarded to No. 11, "The Red Shield," both for design and drawing. To No. 3, "Bridge," I should have awarded the medal of merit, and am quite at a loss to understand why one of the weakest set sent in, both in design and drawing, should have been deemed worthy of an extra prize. In the Owen Jones competition I should consider that Mr. McLachlan would be much better able to scheme out colour decoration for a building than Mr. Richardson, and quite capable of selecting a good colourist to carry it out; and that is probably one of the objects which Owen Jones had when he offered the prize. There are plenty of women artists who could make much better copies than those produced by Mr. Richardson, and, as this is the second, if not the third, time that Mr. McLachlan has sent in, the neglect to reward his work is all the more to be regretted. At all events, I desire to call the special attention of those visiting the exhibition next week to the exceptional beauty of Mr. McLachlan's drawings.

I think it would be fairer to the students if on this one occasion in the year the Council were to meet at 3 p.m., and settle the awards before the regular Council meeting, instead of trusting to chance to have a comparatively short time to go through the reports of the committees of experts appointed by the Council for each subject, between the Council meeting and the dinner.

R. PHENE-SPIERS.

WHAT IS A BUILDING?

SIR,—It appears to me that there are some people who seem to think that they are at liberty to erect any kind of building or structure without coming into contact with any authority. It has always been most unfortunate that no Building Act contains a definition of a "building." I have not seen the buildings referred to in your last issue, but it is perfectly clear that they must come under one of three heads:—

(1) If they are buildings which comply with the regulations of the London Building Act, the District Surveyor can deal with them.

(2) If they are buildings which do not comply with the Act, then they are special buildings, for which the consent of the London County Council should be obtained, under Section 82.

(3) If it is the intention of the owners to erect the buildings for a temporary purpose, then the consent of the L.C.C. must be obtained under Section 83.

London contains hundreds of buildings which have been erected without the knowledge of the authorities, and they are so dangerous and unsightly that nobody can blame the District Surveyor for keeping a careful watch to prevent their increase.

HENRY LOVEGROVE.

RISK OF FIRE IN BUILDINGS.

SIR,—At the present time, when we hear of so many outbreaks of fire in buildings, both public and private, would it not be worth while to know whether there is any table published giving the percentage of fire risks to every class of building. And, if so, it should form a valuable guide to those about to design as well as those interested in the management of public buildings. By such a table one should be able to learn the risk from fire a certain class of building is put at from actual records, and so take the necessary precautions to provide against the percentage of danger.

ANDREW SOUTH.

RUBEROID ROOFING.

SIR,—Following our communication, which appeared in your issue of the 26th ult., regarding the fire-resisting qualities of Ruberoid roofing, and in which we stated that we had not heard of a single instance of a fire occurring in this country where it had been used, we now beg to say that the fire in Piccadilly on the 13th inst. confirms in every respect what has been reported from other countries of the fire-resisting qualities of Ruberoid under big conflagrations.

The foreman's office, erected at the corner of Piccadilly and Arlington-street, on the site of the new Ritz Hotel, was covered with one-ply Ruberoid roofing, which is one of the thinner grades, and although the flames were licking the roof for five and a half hours it made no appreciable effect, and consequently the woodwork was preserved and the roofing is almost as good as when laid.

ROBERT BLACKWELL AND CO., LTD.,
per Chas. Brock.

WITHAM PARISH CHURCH.

SIR,—An incident related to me by the present rector forms a droll appendix to your interesting account of this beautiful old church.

It seems that a former rector could see no use for the late fifteenth century screen inside the church, and thought it more useful and ornamental as railing for the rectory garden. It was taken down, sawn up, and used in this and similar positions. When this gentleman was preferred—I think to Winchester—his parishioners were at a loss to know how to fittingly perpetuate the memory of his sterling qualities.

After some discussion it was decided to pull down the aforesaid garden railings and re-erect them in screen form once more inside the church. This was done, with an inscription in memory of the Rev. Vandal in question.

PERCY BACON.

ROYAL COMMISSION ON LONDON LOCOMOTION.

ON Thursday last week, at a sitting of the Royal Commission on London Locomotion, held under the Chairmanship of Sir David Barbour, evidence was given by Sir Douglas Fox, who was joint Engineer to the Liverpool Overhead Electric Railway, and has been engineer to a number of the tube railway schemes before Parliament. He expressed the opinion that short local traffic could best be met by motor omnibuses and surface tramways, but the only method of dealing with traffic coming from the suburbs into the heart of the City was by tube railways. While shallow subways for tramways were feasible, he believed the cost would be prohibitive. The secret of the success of the tubes had been the placing of the tube in London clay, below the made ground and water-bearing strata which overlies the clay. The damage done to St. Paul's Cathedral by the construction of a sewer in the gravel showed plainly what would be the effect of the pumping which would be necessary in constructing subways under the surface where shields could not be used. He strongly advocated the establishment of a permanent tribunal to deal with all schemes affecting London locomotion. Witness said he was Deputy-Chairman of Sir S. Waterlow's Company for Improving the Dwellings of the Industrial Classes, and for over thirty years had taken an active interest in this important question. Undoubtedly, people preferred to live outside London, where they could afford the time taken up in travelling and the expense of the same, but he did not think that was feasible, except for those of the working classes who were comparatively well off. The London County Council's estate at Tooting was very nice in its way, but he did not think it was altogether satisfactory as a solution of the housing problem. The London County Council had practically thrown away all the advantages of the cheaper land by accommodating fewer people on it, with the result that their rents, plus travelling expenses, were nearly as high as in the block buildings in London, so that by obtaining cheap land they had not done anything to house those who could not afford to pay the rents in the dearer parts. His company's rents averaged 2s. 3d. per room per week, taken over all the estates. To take a modern instance, they erected a block of buildings in the Old Kent-road—a small block, and, therefore, proportionately more costly—in 1899-1900, with a rent of 3s. per room per week, and, after allowing for all expenses, including sinking fund and redemption of the cost of the buildings in ninety years, and a ground rent of 2¾d. a foot super., there was a balance left sufficient to pay 3*l.* 18s. per cent. on the capital expenditure. This was without making allowance for empties. Municipal housing was undoubtedly expensive compared with a company's, for, in addition to their buildings costing more per foot cube, they had to repay the cost of the land, estimated at its housing value, and the building in sixty years. The practice of the London County Council was to write the land down to housing value. The system of the Metropolitan Board of Works was to clear the site and put it up to auction for housing purposes, and they got the best price they could for it. His company had hardly ever built on land at its full commercial value, except in the earlier days—it had either been written down as an improvement by the local authority, or else let by the ground landlord at a reduced rent. For instance, the company only paid 2d. per foot super. for the Grosvenor estate between Oxford-street and Grosvenor-square. He hardly knew what the phrase "rents ruling in the neighbourhood" meant, for the rents charged by his company for their rooms per room were always lower than those charged round about; but the rents charged by the company were generally considered by the people to be higher because of the stringent regulations which the company made as to overcrowding. As the company would not allow overcrowding, it was possible for a man to house himself and family in the vicinity cheaper than in the company's tenements, but not under proper sanitary and moral conditions. He thought it probable that in the near future rents in the outlying parts would have to be increased, as the rates were going up. Another thing calculated to thrust up the value of suburban property was the increased facilities of access. He believed it would be possible for private enterprise to hold its own with municipal building for many years to come, but when the time of redemption was passed the County Council would be able to reduce the rents below those which the companies would be able to charge, as the companies naturally expected to get a return for the capital cutlay. His company was not at present getting so prosperous a class of tenants as they did a few years back, and he attributed that to the fact that men earning higher wages went further afield into the suburbs, and the tenements they used to occupy were now occupied by a somewhat poorer, but most respectable, class, who were only too glad to get decent accommodation near their work. He thought this was a proper solution of the problem, as it brought about a general process of levelling up.

At a further sitting of the Commission, under Sir David Barbour, on Friday, Mr. A. C. Morton, Chairman of the Streets Committee of the City Corporation, put forward the views which his Committee had arrived at with regard to the establishment of a tribunal to deal with all questions of London locomotion. It was considered that the members of the tribunal should be paid, and should devote their whole time to the work. They should consider the schemes presented to them, and report from time to time on the subject of the traffic and locomotion in London generally, but should not have power to direct improvements to be carried out. They should report on local improvements required and on locomotion generally. The tribunal should not be responsible for the supervision of works. They should include in their general reports the streets which, in their opinion, should be made or widened. All tramway schemes should be settled by the tribunal, subject to the rights of local authorities. The tribunal should have the power to confer compulsory powers in regard to the acquisition of property upon promoters of schemes; they should have power to compel existing companies to carry out new works, after hearing all parties interested, who should have the right to be represented in the manner they thought best. The powers of the tribunal should be retrospective, and they should, as far as possible, have a settled policy of action, so as to insure continuity of principle. The road authorities should have complete control in regard to the opening of streets in their respective districts. The tribunal should have the power to apportion the cost of improvements, according to the advantages derived from the same, in districts contiguous to those in which improvements are effected. The tribunal should settle all questions in dispute between local authorities and companies and promoters of schemes of proposed improvements or for facilitating locomotion.

Replying to Sir J. Wolfe Barry, witness said there was no doubt that the Holborn Viaduct had greatly relieved traffic, and he did not think the City regretted having gone in for that.

Alderman Sir Henry Edmund Knight was then called, and, in the course of his evidence, suggested the construction of suspension bridges at such points as Ludgate-circus and Oxford-circus. A suspension bridge would leave the whole of the roadway below it quite free, and might be made an ornamental feature of the streets. On the question of tramways, witness considered that they were of great public utility where streets were wide and not congested with other traffic, but they would be impracticable in the City, and should not be permitted in any town unless the lines could be laid 20 ft. distant from the kerb. With regard to heavy goods traffic, witness was of opinion that the remedy was for it to come out of the streets altogether. He suggested two zones or ellipses of underground electric railway, one about a mile north or south of the river, and a second about a mile or a mile and a half further out. These railways would have two sets of rails each, and the tubes should be made to carry the ordinary railway stock.

The Chairman: Have you any idea how long the lines would be?

Witness: Yes, about forty miles; the expense would be heavy, but he believed it would pay for itself. All railways bringing goods into London should be compelled to make connexions between the suggested railways and their goods stations. Depôts on the railway

should be about a mile apart. Large establishments on the route might be accommodated with sidings to themselves, the goods being lifted to the surface by lifts. There should be sidings at docks also. Goods that could not be carried underground, such as builders' plant, should be carried by motor traction, delivery being limited to certain hours. The cartage of coal was responsible for a great deal of traffic, and he considered that the use of coal in London should be interdicted, and gas substituted for heating and cooking.

Questioned as to his suggestion to have suspension bridges, witness said that at Oxford-circus there were some six or seven lines of traffic, and the necessary width taken up by the bridge would be only 25 ft., so that it would not interfere with the shops at that point. A gradient of 1 in 30 would be sufficient and the height of the bridge need be only 14 ft.

COURT OF COMMON COUNCIL.

THE first meeting of the Court of Common Council after the Christmas vacation was held on Thursday last week at the Guildhall, the Lord Mayor presiding.

Among the petitions received was one from a number of Clapton residents, asking for financial help towards the expense of acquiring the Springfield Estate, Upper Clapton, for the formation of a new park. Mr. Howes, who appeared for the petitioners, stated, in answer to questions, that the estate had been offered for the sum of 40,000*l*., but the offer extended to March only. The Hackney Borough Council had voted 10,000*l*. towards the scheme, and the London County Council 20,000*l*. The upkeep of the park would be undertaken by the London County Council. The committee for the acquisition had raised some 4,000*l*., and it was hoped that more might still be raised locally. About 6,000*l*. was therefore the amount required.

There was some discussion when the speaker for the petitions withdrew, and eventually, on the motion of Mr. Lile, seconded by Mr. Fortescue, the petition was directed to lie on the table.

On the recommendation of the Streets Committee, it was agreed that the carriage ways of the undermentioned streets be paved with creosoted deal blocks, laid on Portland cement concrete, at a total cost of 1,277*l*. 10s.: Circus-place, Finsbury-circus (between Circus-place and East-street), Pilgrim-street (portion), and New Hill-street. The same Committee reported on two letters received from the London County Council, relative to certain building proposals in the City. The first letter referred to an amended application by Mr. H. Chatfeild Clarke, on behalf of the Indemnity Mutual Union Assurance Company, for consent to the erection of a projecting balcony over the entrance to No. 1, Old Broad-street. On the recommendation of the Committee it was agreed that the Council be informed that the Corporation disapproved of the proposal as shown upon the plan accompanying the application. The second letter had reference to an application by Mr. R. M. Roe for consent to the erection of a building in Basinghall-street, abutting upon Church-alley, on the site of St. Michael Bassishaw. The Committee had no objection to offer to this, and it was agreed to inform the London County Council accordingly. Other recommendations of the Committee were that certain repairs and repainting be carried out at a number of underground conveniences in the City, at a cost of 500*l*., and that wire baskets for the reception of orange peel, etc., similar to those attached to the street orderly bins in Poultry and Cheapside, should be fixed on all the remaining bins in the City, at an estimated cost of 230*l*., including those on trial. These recommendations were agreed to. A resolution passed at the Bishopsgate Ward-mote, urging the necessity of the widening of Bishopsgate-street, near Norton Folgate, being carried out at the earliest possible moment, was received without discussion, and among other correspondence received was a copy of a letter addressed by the Board of Trade to undertakers under Electric Lighting Orders, 1889, 1895, 1898 No. 2, and 1899, conveying the Board's formal consent to the transmission of electrical power up to 2,000 kilowatts in certain trunk mains; a letter from the same authority sanctioning the appointment of Messrs. H. Mettam and T. L. Davis as Sanitary Inspectors in the City of London; a resolution of the Vestry of the Parish of St. Giles Without, urging the desirability of completing the purchase of the land on the north-west end of the parish church at as early a date as possible; and a letter from the Ward Clerk of Farringdon Without, forwarding a copy of a report of the Ward Committee, adopted by the Ward-mote, containing the following recommendation: "That the Corporation should not contribute towards the cost of forming the proposed roadway from Giltspur-street to King Edward-street, as this is entirely a business matter on the part of the Governors of Christ's Hospital in developing their building estate."

GENERAL BUILDING NEWS.

REOPENING OF COTTON CHURCH, SUFFOLK.—The Church of St. Andrew, Cotton, has been closed for nearly two years, owing to the unsafe condition of nave and aisle roofs. The nave roof has now been restored, and the restoration of north and south aisles has been entered upon. The cost of the work has been just under 2,000*l*. Mr. P. L. Groom, of Ipswich, has carried out the work, under the supervision of Messrs. Bisshopp and Cautley, the architects.

ST. MARGARET'S, DALTON-IN-FURNESS.—The Bishop of Carlisle dedicated St. Margaret's new church at Dalton-in-Furness on the 13th inst. The church has been erected to take the place of an old iron building, which had done duty for thirty years. The new structure has been built to the plans of Mr. Bassnett Preston, of Manchester, at a cost of 4,200*l*.

PROPOSED EXTENSION OF CHELL WORKHOUSE, STAFFORDSHIRE.—At a meeting of the Wolstanton and Burslem Board of Guardians on the 12th inst., a report was received from the Board's Architects, Messrs. Slater and Walley, with respect to the proposed erection of a new infirmary and additions and improvements at Chell Workhouse. The plans provided for additional accommodation for about 120 inmates, and the work involves an estimated expenditure of 12,500*l*. On the recommendation of the Workhouse Committee, it was decided to submit the plans to the Local Government Board for their approval, and to apply for sanction to borrow 12,500*l*. for the purpose of carrying out the scheme of extension and improvement. The Guardians further resolved to instruct their architects to prepare plans and advertise for tenders for supplying the Workhouse with an electric light installation.

COUNTY COUNCIL SCHOOLS, BLYTH.—The new public schools at Crofton, Blyth, erected by the Northumberland County Council at a cost of 11,000*l*., were opened on the 11th inst. The schools are one-story in height, and provide accommodation for 750 scholars. The plan adopted permits of further extensions to increase the sitting accommodation to at least 1,050. Messrs. Braithwaite and Co., of Heaton, were the contractors; Messrs. Shaw and Vowles, Burnley, architects; and Mr. H. Bower, Blyth, clerk of works.

DRILL HALL, BEDFORD.—A new drill hall has been erected for the 3rd Volunteer Battalion Bedfordshire Regiment at the corner of Gwyn-street and Greenhill-street, Bedford. The work has been carried out by Mr. C. Negus, builder, of Bedford, from the plans of Mr. H. C. Inskip, architect, also of Bedford.

POLICE STATION FOR NEWPORT, MON.—Mr. W. A. Ducat held an inquiry at Newport Town Hall recently on behalf of the Local Government Board, into an application made by the Corporation for leave to borrow 4,430*l*. for the purpose of building a new Police Station at Pill. The Town Clerk (Mr. A. A. Newman) explained that the total amount proposed to be borrowed, 3,995*l*. 16s. 6d., was the estimated cost of building the place, and 434*l*. 10s. for the purchase of the site, which is a portion of the surplus lands purchased from Lord Tredegar for the purpose of erecting the transporter bridge. The Borough Engineer explained the plans, which provide on the ground floor for five cells and a drunkard's cell, on the first floor quarters for a resident sergeant or inspector, and at the rear of the sergeant's house rooms for four single constables. The cells and cell corridor would be in white glazed bricks, and constructed entirely in accordance with the regulations of the Prisons' Department of the Home Office. Hot water heating would be provided, and electric light.—The Inspector subsequently viewed the site.

INFIRMARY, SWANSEA.—At the Swansea Union, Mount Pleasant, on Monday, the opening of the new infirmary block of buildings took place. The architect was Mr. W. H. Wills (London), and Messrs. Lloyd Bros. (Swansea) have carried out the building work, which has taken over two years to complete. The whole undertaking cost about 17,000*l*.

SUTTON COLDFIELD TOWN HALL.—In our short description of this last week the names of the architects were given as "Mason and Eddison"; it should have been "Mayston and Eddison." The mistake was not ours.

ENGINEERING STANDARDS COMMITTEE.—The Council of the Institution of Civil Engineers have nominated their President, Sir William Henry White, K.C.B., F.R.S., to fill the place of the late Sir Frederick Bramwell, Bart., as one of the representatives of that Institution on the Engineering Standards Committee.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. Frederick Wheeler, architect, of 6, Staple-inn, London, and Horsham, has taken his son, Mr. C. W. F. Wheeler, into partnership, so far as his London practice is concerned, which will in future be carried on at the above London address under the name of Frederick Wheeler and Son.——An agreement has been entered into between Messrs. Wm. Lee, Son, and Co., Ltd., lime and cement manufacturers, of 15, Upper Ground-street, Blackfriars, and Messrs. Eastwood and Co., Ltd., brick manufacturers, of 47, Belvedere-road, Lambeth, for the amalgamation of the retail businesses of the two companies. For the purpose of carrying out this agreement a new company has been formed, under the style of Lee and Eastwood, Ltd. The chairman of the new company will be Mr. S. Lee Smith, of Messrs. Wm. Lee, Son, and Co., and Mr. George E. Wragge, of Messrs. Eastwood and Co., will join the board.

EXHIBITION, BRADFORD.—Mr. W. C. Lupton presided on the 6th inst. over a meeting of the Bradford Cartwright Memorial Hall Committee, who have in hand the arrangements for this year's exhibition in Lister Park, in connexion with the opening of the hall. The Building Committee reported that the industrial hall would be roofed in a fortnight. The concert hall will accommodate 2,000 people. Tenders for the erection of the illuminated bridge have been invited, and the building of the water chute has been commenced.

FALL OF COPING STONE.—In the Paddington Coroner's Court on Saturday last, Dr. Danford Thomas held an inquest on the body of A. J. Mardell Dores, aged 31 years, a carpet planner, of Blemheim-terrace, North Kensington. The deceased was the victim of a sudden collapse of coping stone or cornice overhanging the premises of Mr. William Mardell, upholsterer, etc., 216 to 220, Westbourne-grove. Mr. S. F. Clarkson, District Surveyor for the London County Council, said that the work in progress in Mr. Mardell's shop had nothing to do with the accident. The fact was that the original construction of the cornice or coping was defective. Quite thirty tons of stones and bricks were precipitated some 30 ft., and the bricks were so clean of mortar as to suggest that there was no proper pointing. He produced a sample of the mortar, and it crumbled in the coroner's hand. The witness added that he was afraid there were a good many buildings of the same sort in the district, but he had not long been appointed, and, of course, he had not had time to make a complete inspection. The jury returned a verdict of "Accidental death."

COLLAPSE OF A ROOF AT SUNDERLAND.—An accident, which resulted in the loss of one life and severe injuries to a number of other persons, occurred on the 15th inst. at the engineering works of Messrs. John Lynn and Co., Pallion, Sunderland. Some ten or eleven men were engaged inside a core-drying stove, when the roof fell in and buried them. The drying stove was a square brick building, with a roof of cast-iron plates covered with clay. The building was supported on girders, and it is supposed that the cause of the accident was the sudden collapse of one of these girders. It was shortly before three o'clock when the heavy roof fell and pinned to the earth the majority of the unfortunate men employed on the spot. No time was lost in starting the work of rescue, but the task of extricating the injured was very difficult. One man named Stephen McFarlane had been terribly crushed under a girder, and was found to be dead, while seven other men were conveyed to the infirmary, where it was found that several of them had sustained shocking injuries.

HEREFORD MASTER BUILDERS' ASSOCIATION.—The members of the Hereford and District Master Builders' Association dined together at the Mitre Hotel, Hereford, recently. Amongst the company were Mr. Powell (President), Mr. E. W. Wilks (Vice-President), and the Mayor (Alderman H. C. Beddoe). The President proposed the toast of "The King and Royal Family," and Mr. W. A. Linton next submitted "The Town and Trade of Hereford," and in alluding to the architecture of the city spoke of the noble cathedral, which he said gave visitors and Herefordians alike food for reflection. Whenever he looked upon that beautiful building he could not help thinking what manner of men they must have been in the old days, and what a wonderful love they must have had for their art and work.—The Mayor, in response, said he was glad to hear Mr. Linton's remarks with regard to the grand old cathedral; what Mr. Linton felt was also felt by a great number of people who came to Hereford, and also by the citizens themselves. It was one of the finest cathedrals in the west of England, and possessed beautiful Norman architecture. Various restorations had been effected, especially since the falling down of

the west end some 110 years ago. The Dean had latterly taken the west end in hand, and a great improvement was being effected. The city had done good work in improving the dwellings of the poor, and there was not one single member of the Corporation, whatever his general views might be, who did not desire to see the proper housing of the poorer classes. At one time Hereford was a walled-in city, and within his remembrance there were formerly very few buildings outside the limits of the old city. They attributed this to the attacks of the Welsh: people sought the protection of the walls. There was very little property around the city he had not had something to do with at one time or another. It formerly belonged to the Ecclesiastical bodies, but an Act was passed about fifty years ago which gave power to the Ecclesiastical bodies to sell, and since then very rapid strides had been made.—Mr. Witts also responded.—Mr. Arkwright then proposed "The National Federation of Master Builders of Great Britain and Ireland, and the South-Western Federation of Building Trade Employers." In the course of his remarks he said that the question of the timber supply was a matter of the most vital interest to the building trade, because whatever might take the place of timber for building purposes, they would not advance sufficiently in scientific knowledge in order to produce a material which could be subsituted for timber to any large extent for a considerable number of years to come. He thought he might say without fear of contradiction that anything like a serious shortage in the supply of timber would be a very grave matter for the building trade. It would be a grave question not only for the master builders, but also for the men working in the trade, and indeed he might say the nation at large. What were the facts as they found them? He was afraid that not only this country, but the whole of Europe, would be faced within the next thirty years with something like a very serious timber famine. Builders were now paying prices for timber which was called first class, which they would have regarded as second class and paid for at a lower rate ten years ago. He believed it was a fact that 78 per cent. of the English timber trade was done in coniferous timber. A very large proportion of the timber came from abroad. He believed that in every contract which the Government made, a clause was put in to the effect that no English timber was to be used. Other people made the same stipulation, and therefore they had arrived at this point, that for some reason or other English timber was deteriorating from a builder's point of view, and that the foreign supply was failing, and consequently becoming dearer. The reasons why the foreign supply was dearer were two-fold. In the first place there was less timber, and, secondly, it cost more to place it on the market than it used to do. This was perhaps not apparent at first sight, but it was easily explainable. In the early days, when they were cutting down virgin forests—trees planted in dense patches with no branches except at the top, where they caught the sunlight, and therefore having no knots—the facilities offered by the Norwegian rivers were fully taken advantage of. The trees were cut down on the banks, marked, rolled into and carried by the river, and recognised by the respective agents of the owners at the bottom. Thus a considerable saving was effected. Now, however, things had altered. As trees were cut down, the river became further and further away, and thus there was the cost of hauling, etc., which sent up the price. The foreign supply was growing less and less every day, and the English timber, not to put it at too fine a point, was not fit for use. Let them examine for a moment the extent of the English timber trade. Why was it that the Government did not allow English timber to be used in their contracts? Why was it that the whole of the building trade had so little to do with English timber? He excepted oak. The reason was because the English trees were not of much value as timber. This was because of the numerous branches, which created knots in the wood. That was the plain and simple reason. If they went into an English woodland, of course it was very beautiful, but then it did not provide good timber. The German and the French system of timber growing, encouraged by the Governments, was based on scientific and commercial principles. They grew a great many more trees to the acre than the English did. The object was to secure a long straight stem without branches except at the top. Ordinary timber was practically useless, and that was why they depended so much on a foreign supply. The report of the Forestry Commission laid it down that the timber grown in England could be grown on less than half the acreage it now occupied. The English timber was what might be described as of third-rate quality. These questions necessitated serious consideration at the hands of the British Government.—Mr. Dowling first replied, and said that the object of the two federations was their uplifting as builders. These federations had given them more prestige, and had secured a different and a better form of contract. — Mr. Cowlin, treasurer of the South-Western Federation, also responded, and said that the question was very often asked: "What is the use of a federation?" Well, the building trade came next to the coal and iron trade in the matter of importance, and it was essential that their interests should have every protection. Architects and employees had national institutions, and therefore it was imperative that the builders should similarly band themselves together. Local associations were part of the national, and therefore they should be supported. The very existence of the National Federation was a great factor for peace.—Mr. C. Cooke gave the toast of "The Architects and Surveyors of Hereford," coupled with the names of Messrs. A. R. Groom, J. Parker, and A. Dryland, who responded.—Mr. Langford proposed "The Hereford and District Master Builders' Association," and the Chairman replied.

BEDFORD BUILDERS' ASSOCIATION.—The second annual dinner of the resuscitated Bedford Builders' Association was held at the Central Restaurant, High-street, recently, Mr. Richard Black, President of the Association, occupying the chair. After the loyal toast had been honoured, Mr. Charles Negus proposed "The Mayor and Corporation," and Alderman Burridge responded. Mr. Guy Pym next proposed "The Builders' Association." In a town like Bedford a building association must be one of very great importance. The whole town was at the mercy of the builders, and if they did not recognise their responsibilities the town would suffer in the character of its buildings, and these, in their influences on the people inhabiting them, would bring about the unpopularity of the town. Sixty or seventy years ago people were content to live in any sort of a house, and the countryside was made hideous with buildings which looked as though they had been built by the mile and cut up into sections; but there had been a distinct improvement, and the charming variety of houses now was quite a feature. Labour was a most important question, and an exceedingly interesting one. It was a subject which would have to be taken into account more and more every day in relation to every productive industry in the country. If they went to the United States they would find that the spirit which filled the mind of every working man was that he would do his best, and do the greatest amount of work during his hours of labour. He went to his work every day with the intention of sticking to it from the moment he commenced to the moment he put his coat on to leave the factory. His friend, Mr. Black, who had had a large practical experience in the United States, told him that the masters paid double the wages they paid here, but they could afford to do it because the men gave the full value in their work. That was a thing for them all to consider, independently of politics. American people ran the risk of buying expensive machines because they knew they had made it to the interest of their workmen to get every possible bit of work out of the machines. He coupled the name of the President with the toast.—In response, Mr. Black said that anyone who knew anything about the building trade in Bedford must know that it was time such an Association was revived again. For the last two or three years it had not been always easy for Bedford builders to discharge their duties in a way they ought to be able to do. It was felt that undue pressure was being put upon them and that they were hindered in performing the duties they had an honest desire to perform. Since the re-formation of the Association that sort of thing had been partially, if not altogether, remedied. An important matter which affected builders was the form of giving out work in the borough. Many thousands of pounds had been spent in a manner which did not recommend itself to the builders of Bedford. They were absolutely unanimous on the point that all public work done out of the public funds raised by rates should be publicly tendered for. Every man should have an opportunity of tendering for that work on his merits.—Mr. Valentine proposed "Town and Trade of Bedford," and Mr. Randall responded, and Mr. R. Melcombe proposed "The Visitors," coupled with the names of Mr. Lindley and Mr. J. P. White.

BRISTOL MASTER BUILDERS' ASSOCIATION.—The annual meeting of this Association was held, on the 18th inst., at the Guildhall, Small-street, under the Presidency of Mr. Alfred Dowling. After the reading and confirming of the minutes of the last annual gathering, the Secretary, Mr. Henry J. Spear, presented the annual report, of which the following is an abstract:—The building trade of Bristol during 1903, like many other trades, has been of a relaxed character. Only one little misunderstanding between masters and men has taken place, and that was speedily settled by requesting the member to conform to the rules. The Plumbers' Registration Bill was again introduced into Parliament, and the Association requested the four members for the city to oppose the measure, it being considered useless and unnecessary, and not in any way safeguarding the public from bad work, with its consequent ill-effect on health. The Association also approached the four Bristol members, asking them to support the appointment of a Royal Commission to inquire into the question of municipal trading, and such committee had been appointed, and specially considered the question of sanitary work. Two bills were presented to Parliament dealing with the law as regards trade disputes and liability of trades unions, and the Association unanimously passed a resolution: "That the Bristol Master Builders' Association has carefully considered the Trades' Disputes Bill now before the House of Commons, and is of opinion that the motion by Mr. Galloway, M.P., upon the second reading, should receive the hearty support of all members of Parliament. That this expression of opinion be conveyed to them and the South-Western Federation." The outcome was that the Bill was referred to a Select Committee of the House of Commons. A bill dealing with the Extension of the Powers of Compensation Act, 1898, to all trades, irrespective of locality or height or depth of building, was considered by the Association, but no action was taken thereon. The following resolution passed by the Association in 1901, dealing with the question of time limit, was re-confirmed this last year, and the members were urged to rigidly adhere to same: "That no member of this Association shall tender for work in competition where he is required to state the time in which he will complete the said work." Acting upon the advice of the Association solicitor, Mr. W. H. Brown, the Association considered the various clauses in the Corporation contracts then in vogue, and accepted certain alterations, but declined to send in priced bills of quantities with tenders, as being contrary to the recommendation of the National Federation of Building Trade Employers of Great Britain. National Federation meetings have been held in London and Cardiff, and the Association had been duly represented at both. At the latter, the gratifying announcement was made that after years of negotiation a satisfactory form of contract, drawn up by the R.I.B.A., the Institute of Builders, and the National Association of Master Builders of Great Britain and Ireland, had been actually accomplished, and it was described as one of the most satisfactory undertakings ever brought about by those associations.— The Hon. Treasurer (Mr. G. Humphreys) presented his financial statement, which was of a satisfactory character. The President then proposed the adoption of the report and accounts, and said it was his pleasure and privilege to do so, for he considered the report to be a succinct *résumé* of the work performed by the Association during the past twelve months, and to his mind it proved the value of such organisations. Through the courtesy of their secretary, he had been favoured with the most recent return of the Board of Trade, from which he observed that there was a general wave of depression in the building trade through the country; but he trusted that business would generally revive, so that the building trade might follow in the wake of contentment at home and abroad. Although the building trade in Bristol during 1903 was rather quiet, yet it compared very favourably with other large centres in quantity and character of work done. Among the many subjects which received attention were the Corporation form of contract, the question of sending in priced bills of quantities, and the stating of time by which the contract would be completed at the time of tendering. In both of these cases it was decided to rigidly adhere to the rules by not stating the time or sending the priced quantities unless successful. Mention must be made of the annual outing, which was well attended by members, visitors, and fine weather, across the Mendip Hills to Wells, which gave an opportunity for members to become better acquainted with each other.—Mr. F. N. Cowlin seconded the adoption of the report and accounts, and the proposition, having been put to the meeting, was carried unanimously. The President then said it was his pleasing duty to propose Mr. E. I. Neale as President of the Association for the current year. This, having been seconded, was carried unanimously. Upon the motion of the President, seconded by Mr. E. Walters, the following resolution was carried with acclamation: "That the heartiest thanks of this Association be accorded to Mr. Alfred Dowling for the assiduous manner in which he has presided over the deliberations of the Association during the past year, thereby maintaining the usefulness of the Association in furthering the various objects it endeavours to accomplish." On the

motion of Mr. G. Wilkins, seconded by Mr. A. Krauss, it was resolved that Mr. F. R. Ridd be elected the Vice-President of the Association for the ensuing twelve months, and it was carried unanimously. At the instance of Mr. W. Foster, seconded by Mr. F. A. R. Woodward, Mr. George Humphreys was re-elected the hon. treasurer to the Association. The election of the committtee was then proceeded with, and delegates were appointed for the forthcoming annual meeting of the National Federation in London, and also delegates for the South-Western Federation. The question of the audit of municipal accounts and other subjects of interest to the trade were then discussed.

Legal.

BUILDER'S APPEAL UNDER THE WORKMEN'S COMPENSATION ACT.

In the Court of Appeal, composed of the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy, on the 13th inst., judgment was delivered in the case of Barrett *v.* Kemp Bros., on the defendants' appeal from an award made by the Judge of the Sittingbourne County Court under the Workmen's Compensation Act, 1897.

In this case the plaintiff was a workman in the employment of the defendants, a firm of builders and contractors, who leased and occupied a wharf on the river Medway, used for the purpose of loading and unloading materials used by the defendants in their business. There was no machinery or plant on the wharf, and anyone was allowed to use the wharf on payment of wharfage. Leading from the public highway to the wharf was a private road, about 250 yds. long and about 11 ft. or 12 ft. wide, the defendants being the lessees and occupiers of this private road. This road was separated from the highway by a gate, which was kept locked when the road was not being used by the defendants and their servants, the defendants keeping the key. The defendants' name was on the gate, and the road and the wharf were bounded on both sides by a hedge, except on the frontage to the river and at the junction with the road. The plaintiff was employed on the private road breaking stones for the purpose of repairing the road, and when at work about 40 yds. from the gate he was struck in one of his eyes by a piece of stone, and he lost the sight of it. It appeared that the plaintiff had never been employed on the wharf itself. The County Court Judge held that the employment on the road leading to the wharf was employment on or about the wharf, and that the wharf was a "factory" within the meaning of section 7 of the Act, and he made an award in the plaintiff's favour. Hence the present appeal of the defendants, on whose behalf it was contended that the wharf was not a "factory" within the meaning of the section. It was admitted that if the wharf was a "factory" the defendants were the "undertakers" in respect thereof.

In the result, their Lordships, without calling upon counsel for the plaintiff, held that the wharf was a "factory" within the meaning of the section, and that the accident happened on a road within the curtilage of the factory.

The appeal was accordingly dismissed, with costs.

Mr. G. A. Scott appeared for the appellants, and Mr. Cecil Walsh for the respondent.

LONDON BUILDING ACT.

At the South-Western Police-court on the 14th inst., Mr. J. Gibbs, builder, of 31, Upper Richmond-road, Wandsworth, was summoned by Mr. Lawton Ford, District Surveyor, for erecting a public building at the Wandsworth Convent, West Hill, without having given a complete and proper notice, the incompleteness consisting in omitting to deposit plans and sections as required by the by-laws made by the London County Council. It appeared that the District Surveyor had made repeated applications to the defendant to deposit the drawings, but, they having been submitted, the defendant declined to do more.

Mr. Francis, the magistrate, said that the law appeared to be quite clear, and imposed a fine of 40*s.* and costs.

CAPITAL AND LABOUR.

Employment in December.—According to returns furnished by 84 Employers' Associations whose members are estimated to employ about 100,000 workpeople, and by Trade Unions with an aggregate membership of about 185,000, employment with all branches but masons is bad, and rather worse than a month ago and a year ago. With masons employment is quiet on the whole, and shows no great change as compared with a month or a year ago. The returns from Employers' Associations show that employment was good with 4.0 per cent. of the workpeople reported on, fair or moderate with 18.4 per cent., and dull or bad with 77.6 per cent. The corresponding percentages were, a month ago, 11.0, 17.6, 71.4; and a year ago, 5.0, 23.0, and 72.0. Employment with bricklayers is reported as dull generally, and rather worse than a year ago. With masons it is fair in England and moderate in Scotland. With carpenters and joiners, painters and plasterers, it is dull generally. The percentage of unemployed Trade Union carpenters and joiners at the end of December last was 7.9, compared with 6.1 at the end of November, and 5.9 at the end of December, 1902. Employment with plumbers continues dull generally. The percentage of unemployed members among Trade Union plumbers at the end of December was 7.7, as against 7.2 in November, and 5.6 in December, 1902. Slaters and tilers report employment as quiet, slightly worse than a month ago, and worse than a year ago. Some distress continues to be reported among builders' labourers in certain districts.—*Labour Gazette.*

TERMS OF SUBSCRIPTION.

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SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 6.—By T. Woods (at Hounslow).

Hounslow Heath, Middlesex.—8 to 15, Gloucester-ter., u.t. 88¾ yrs., g.r. 37*l.* 10*s.*, e.r. 135*l.* 4*s.*	£400
Heston, Middlesex.—North Hyde-la., freehold residence and cottage adjoining, q.r. 30*l.*..	715
Twickenham.—52, Church-st., f., e.r. 30*l.*.....	450
By H. D. Tilly & Co. (at Maidenhead).	
Maidenhead, Berks.—St. Mark's-rd., "Littlecot," f., q.r. 19*l.* 10*s.*	370
January 12.—By Noys & Howes.	
Forest Hill.—151, 157, and 159, Woolstone-rd., u.t. 93 yrs, g.r. 21*l.*, y.r. 95*l.*.....	770
By H. J. Way & Son (at Newport).	
Godshill, Isle of Wight.—"Park Wall Farm," 20 a. 2 r. 11 p., f.	1,475
"Allen's House" and 2¼ a., f., p.....	400
"Eight Acres" Field, 8 a. 1r. 32 p., f.	475
Steephill-rd., "Nessciffe," u.t. 964 yrs., g.r., 11*l.*, p.....	460
By Andrews & Hitch (at Chelsea).	
Chelsea.—12, 13, 14, 18, 24 and 25, Trafalgar-sq., u.t. 5 yrs., g.r. 36*l.*, e.r. 351*l.*.....	780
Trafalgar-sq., two builders' yards, timber yard, saw mills, workshops, &c., u.t. 5 yrs., g.r. nil, y.r. 326*l.* 5*s.*	1,275
Manresa-rd., 1 to 8, and 8a, Wentworth Studios, also "Wentworth Villa," u.t 5 yrs., g.r. nil, y.r. 415*l.*	795
Arthur-st., l.g.r. 146*l.* 8*s.*, u.t. 5 yrs., g.r. nil	910
25, Oakley-cres., y.r. 48*l.*, also l.g.r. 6*l.*, u.t. 49½ yrs., g.r. 12*l.*	570
78, Manor-st. ("Safety Lamp Coffee Palace"), u.t. 49½ yrs., g.r. 6*l.*, y.r. 40*l.*.....	690
41, Fernshaw-rd., u.t. 60½ yrs., g.r. 2*l.* 10*s.*, y.r. 42*l.*	490
Battersea.—1, Kassala-rd., u.t. 71½ yrs., g.r. 7*l.*, e.r. 35*l.*	420
January 13.—Hind & Sons.	
St. George's East.—25 to 43 (odd), Grove-st., f., w.r. 287*l.* 6*s.*	4,005
19, 21, and 23, John-st., f., w.r. 100*l.* 2*s.*.....	1,270
26, 28, and 30, John-st., f., w.r. 44*l.* 4*s.*	1,075
Mile End.—75 and 77, Bridge-st., f., w.r. 62*l.* 8*s.*	750
Hackney.—48, Eleanor-rd., u.t. 53 yrs., g.r. 6*l.* 10*s.*, q.r. 45*l.*.....	380
By F. Varley & Son.	
Bowes Park.—156, Whittington-rd., u.t. 76 yrs., g.r., 6*l.* 10*s.*, y.r. 28*l.*.....	240
January 14.—David J. Chattell.	
Hammersmith.—Raynham-rd., f.g.r. 1d., reversion in 65½ yrs.	120
Studland-st., f.g. rents 10*s.* 7*d.*, reversion in 64 yrs.....	190
Dunton Green, Kent.—"Morant's Cottage," and 2 a. 0 r. 13 p., f., p.	760

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, JANUARY 22.

Architectural Association.—Paper by Mr. Maurice B. Adams, entitled: "As to the Making of Architects, with Examples of Draughtsmanship." 7.30 p.m.

The Junior Institution of Engineers (Westminster Palace Hotel).—Mr. J. Fletcher Moulton, K.C., M.P., F.R.S., will deliver his presidential address. 8 p.m.

Royal Institution.—The Rev. W. Sidgreaves on "Spectroscopic Studies of Astrophysical Problems at Stonyhurst College Observatory." 9 p.m.

SATURDAY, JANUARY 23.

Architectural Association.—First Spring Visit, to the offices of the Royal London Friendly Society, Finsbury-circus, by permission of the architect, Mr. John Belcher, A.R.A. 2.30 p.m.

Builders' Foremen's Association.—10th Annual Dinner, Throne-room, Holborn Restaurant. 6.30 p.m.

MONDAY, JANUARY 25.

Surveyors' Institution.—Mr. Ralph Nevill, K.C., on "The Garden City Scheme and First Garden City, Limited." 8 p.m.

Incorporated Institute of British Decorators (London District, Painters' Hall, Little Trinity-lane, E.C.).—Mr. G. H. Morton (of Liverpool) on "The Primary Colours," to be followed by a Discussion. 8.30 p.m.

Builders' Benevolent Institution.—Committee Meeting 5 p.m.

Glasgow Philosophical Society (Architectural Section).—Mr. Peter Fyfe, Chief Sanitary Inspector of Glasgow, on "Some City Pollutions," illustrated. 8 p,m.

TUESDAY, JANUARY 26.

London Master Builders' Association. — Dinner, Alexandra Hall, Trocadero Restaurant, Piccadilly-circus, W. 6.30 p.m.

Institution of Civil Engineers.—Mr. A. E. Carey on "The Sanding-up of Tidal Harbours." 8 p.m.

Institute of Sanitary Engineers, Ltd. (Lectures in Practical Sanitary Science).—Mr W. H. Maxwell on "Scavenging and Disposal of Refuse." 7 p.m.

National Federation of Building Trade Employers.—Council Meeting.

WEDNESDAY, JANUARY 27.

Architectural Association (Discussion Section).—Paper by Mr. T. H. Russell, M.A., on "The Ventilation of Chemical Laboratories." 7.30 p.m.

St. Paul's Ecclesiological Society.—The Rev. H. Bedford Pim on "Low-side Windows and other Objects of Interest in Churches," illustrated by lime-light lantern views. 8 p.m.

Northern Architectural Association.—Mr. R. P. S. Twizell on "The Origin of Gothic Architecture," illustrated with lime-light views. 7.30 p.m.

Edinburgh Architectural Association.—Mr. J. Maurice Arthur on "Some Interesting and Necessary Legal Points in Building." 8 p.m.

National Federation of Building Trade Employers.—Half-Yearly General Meeting.

THURSDAY, JANUARY 28.

London Institution.—Mr. H. T. Ashby on "A Pilgrimage to Classic Shrines in Greece, Asia Minor, and Crete," illustrated. 6 p.m.

Institution of Electrical Engineers.—(1) Adjourned discussion, to be opened by Dr. J. A. Fleming, F.R.S., vice-president, on Mr. W. Hibbert's paper on "The Edison Accumulator for Automobiles." (2) Adjourned discussion on Dr. Hans Behn-Eschenburg's paper on "The Magnetic Dispersion in Induction Motors, and its Influence on the Design of these Machines." 8 p.m.

Leeds and Yorkshire Architectural Society.—Mr. J. A. Gotch, F.S.A., on "The Homes of Queen Elizabeth." 6.30 p.m.

FRIDAY, JANUARY 29.

Royal Institution.—Mr. D. G. Hogarth, M.A., on "The Marshes of the Nile Delta." 9 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. A. P. Head on "Metallurgy as Applied in Engineering." 8 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. W. G. Peddie on "Comparison of Building Practices in Scotland." 8 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

	£	s.	d.		
BRICKS, &c.					
Hard Stocks.....	1	16	0	per 1000	alongside, in river.
Rough Stocks and Grizzles.....	1	13	0	,,	,, ,,
Facing Stocks ...	2	12	0	,,	,, ,,
Shippers	2	10	0	,,	,, ,,
Flettons	1	10	0	,,	at railway dep't.
Red wire Cuts ..	1	13	0	,,	,, ,,
Best Fareham Red	3	12	0	,,	,, ,,
Best Red Pressed Ruabon Facing	5	0	0	,,	,, ,,
Best Blue Pressed Staffordshire ..	4	4	0	,,	,, ,,
Do. Bullnose	4	10	0	,,	,, ,,
Best Stourbridge Fire Bricks....	4	8	0	,,	,, ,,
GLAZED BRICKS.					
Best White and Ivory Glazed Stretchers	13	0	0	,,	,, ,,
Headers	12	0	0	,,	,, ,,
Quoins, Bullnose, and Flats	17	0	0	,,	,, ,,
Double Stretchers	19	0	0	,,	,, ,,
Double Headers..	16	0	0	,,	,, ,,
One Side and two Ends	19	0	0	,,	,, ,,
Two Sides and one End	20	0	0	,,	,, ,,
Splays, Chamfered, Squints .	20	0	0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers	12	0	0	,,	,, ,,
Quoins, Bullnose, and Flats	14	0	0	,,	,, ,,
Double Stretchers	15	0	0	,,	,, ,,
Double Headers..	14	0	0	,,	,, ,,
One Side and two Ends	15	0	0	,,	,, ,,
Two Sides and one End	15	0	0	,,	,, ,,
Splays, Chamfered, Squints..	14	0	0	,,	,, ,,
Second Quality White and Dipped Salt Glazed	2	0	0	,,	less than best.
		s.	d.		
Thames and Pit Sand		7	3	per yard,	delivered.
Thames Ballast		6	0	,,	,,

BRICKS, &c.—(*continued*)—

	s.	d.	
Best Portland Cement	29	0	per ton, delivered.
Best Ground Blue Lias Lime	20	6	„ „

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	11s.	6d. per yard, delivered.
Stourbridge Fire Clay in sacks	27s.	6d. per ton at rly. dpt.

STONE.

	s.	d.	
BATH STONE—delivered on road waggons, Paddington depôt	1	6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms depôt	1	8½	„ „
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2	1	„ „
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2	2½	„ „

	s.	d.		
Ancaster in blocks	1	11	per ft. cube, deld. rly. depôt.	
Beer in blocks	1	6	„	„
Greenshill „	1	10	„	„
Darley Dale in blocks	2	4	„	„
Red Corsehill „	2	5	„	„
Closeburn Red Freestone	2	0	„	„
Red Mansfield „	2	4	„	„

YORK STONE—*Robin Hood Quality.*

	s.	d.		
Scappled random blocks	2	10	per ft. cube, deld. rly. depôt.	
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per foot super.	„
6 in. rubbed two sides ditto, ditto	2	6	„	„
3 in. sawn two sides slabs (random sizes)	0	11½	„	„
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½	„	„
1½ in. to 2 in. ditto, ditto	0	6	„	„
HARD YORK—				
Scappled random blocks	3	0	per ft. cube	„
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2	8	per ft. super.	„
6 in. rubbed two sides Ditto	3	0	„	„
3 in. sawn two sides slabs (random sizes)	1	2	„	„
2 in. self-faced random flags	0	5	„	„
Hopton Wood (Hard Bed) in blocks	2	3	per ft. cube.	
„ 6 in. sawn both sides landings	2	7	deld. rly. depôt. per ft. super. deld. rly. depot.	
„ 3 in. do.	1	2½	„	„

SLATES.

in.	in.	£	s.	d.	
20	10 best blue Bangor	13	2	6	per 1000 of 1200 at r. d.
20	12 „	13	17	6	„ „
20	10 best seconds „	12	15	0	„ „
20	12 „ „ „	13	10	0	„ „
16	8 best „ „	7	0	0	„
20	10 best blue Portmadoc	12	12	6	„ „
16	8 best blue Portmadoc	8	12	6	„ „
20	10 best Eureka unfading green	15	2	6	„ „
20	12 best Eureka unfading green	17	2	6	„ „
18	10 „ „	12	10	0	„ „
16	8 „ „	10	5	0	„ „
20	10 permanent green	11	10	0	„ „
18	10 „ „	9	10	0	„ „
16	8 „ „	6	10	0	„ „

TILES.

	s.	d.	
Best plain red roofing tiles	42	0	per 1000 at rly. depot.
Hip and Valley tiles	3	7	per doz. „ „
Best Broseley tiles	50	0	per 1000 „ „
Do. Ornamental tiles	52	6	„ „ „
Hip and Valley tiles	4	0	per doz. „ „
Best Ruabon red, brown or brindled do. (Edwards)	57	6	per 1000 „ „
Do. Ornamental do.	60	0	„ „ „
Hip tiles	4	0	per doz. „ „
Valley tiles	3	0	„ „ „
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000 „ „
Do. Ornamental do.	54	6	„ „ „
Hip tiles	4	1	per doz. „ „
Valley tiles	3	8	„ „ „
Best "Rosemary" brand plain tiles	48	0	per 1000 „ „
Best Ornamental tiles	50	0	„ „ „
Hip tiles	4	0	per doz. „ „
Valley tiles	3	8	„ „ „

WOOD.

	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	15	10	0	16	10	0
Deals: best 3 by 9	14	10	0	15	10	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	10	0	12	10	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best		
Battens: seconds	0	10	0	„ „ „		
2 in. by 4 in. and 2 in by 6 in.	9	0	0	9	10	0
2 in. by 4½ in. and 2 in. by 5 in.	8	10	0	9	10	0
Foreign Sawn Boards—						
1 in. and 1½ in. by 7 in.	0	10	0	more than battens.		
¾ in.	1	0	0	„		
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft. 4	10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Small timber (6 in. to 8 in.)	3	0	0	3	10	0
Swedish balks	2	15	0	3	0	0
Pitch-pine timber (30 ft. average)	3	5	0	3	15	0
JOINERS' WOOD.						
White Sea: first yellow deals, 3 in. by 11 in.	At per standard. 23	0	0	24	0	0
3 in. by 9 in.	21	0	0	22	10	0
Battens, 2½ in. and 3 in. by 7 in.	17	0	0	18	10	0

WOOD—(*continued*)—

	At per standard. £	s.	d.	£	s.	d.
JOINERS' WOOD.—(*Contd.*)						
Second yellow deals, 3 in. by 11 in.	18	10	0	20	0	0
„ „ 3 in by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	15	10	0	16	10	0
Battens, 2½ in. and 3 in. by 7 in.	11	10	0	12	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	0	0	22	10	0
Do. 3 in. by 9 in.	18	0	0	19	10	0
Battens	13	10	0	15	0	0
Petersburg: second yellow deals, 3 in. by 11 in.	16	0	0	17	0	0
Do. 3 in. by 9 in.	14	10	0	16	0	0
Battens	11	0	0	12	10	0
Third yellow deals, 3 in. by 11 in.	13	10	0	14	0	0
Do. 3 in. by 9 in.	13	0	0	14	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg:—						
First white deals, 3 in. by 11 in.	14	10	0	15	10	0
„ „ 3 in. by 9 in.	13	10	0	14	10	0
Battens	11	0	0	12	0	0
Second white deals, 3 in. by 11 in.	13	10	0	14	10	0
„ „ 3 in. by 9 in.	12	10	0	13	10	0
„ „ battens	9	10	0	10	10	0
Pitch-pine: deals	16	0	0	18	0	0
Under 2 in. thick extrs.	0	10	0	1	0	0
Yellow Pine—First, regular sizes	33	0	0	upwards.		
Oddments	22	0	0	24	0	0
Seconds, regular sizes	24	10	0	26	10	0
Yellow Pine oddments	20	0	0	22	0	0
Kauri Pine—Planks, per ft. cube	0	3	6	0	4	6
Danzig and Stettin Oak Logs—Large, per ft. cube	0	2	6	0	3	6
Small „ „	0	2	3	0	2	6
Wainscot Oak Logs, per ft. cube	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	7	0	0	8
¼ in. do. do.	0	0	6½		—	
Dry Mahogany—Honduras, Tabasco, per ft. sup. as inch	0	0	9	0	0	11
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	0
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	17	0	0	21	0	0
American Whitewood Planks—per ft. cube	0	4	0		—	
Prepared Flooring—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	6	0	17	6
1 in. by 7 in. yellow, planed and matched	0	14	0	0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	1	1	6
1 in. by 7 in. white, planed and shot	0	11	6	0	1	6
1 in. by 7 in. white, planed and matched	0	12	0	0	14	0
1¼ in. by 7 in. white, planed and matched	0	14	6	0	16	6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	0	13	6
¾ in. by 7 in. do. do. do.	0	14	0	0	18	0
1 in. by 7 in. white do. do.	0	10	0	0	11	6
1 in. by 7 in. do. do. do.	0	11	6	0	13	6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	6	5	0	7	5	0
Compound Girders, ordinary sections	8	2	6	9	5	0
Angles, Tees and Channels, ordinary sections	7	17	6	8	17	6
Flitch Plates	8	5	0	8	15	0
Cast Iron Columns and Stanchions including ordinary patterns	7	2	6	8	5	6

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
IRON—						
Common Bars	7	10	0	8	0	0
Staffordshire Crown Bars, good merchant quality	8	0	0	8	10	0
Staffordshire "Marked Bars"	10	10	0		—	
Mild Steel Bars	8	15	0	9	5	0
Hoop Iron, basis price	9	5	0	9	10	0
„ „ galvanised	17	10	0		—	

(*And upwards, according to size and gauge.)

Sheet Iron (Black)—						
Ordinary sizes to 20 g.	9	15	0		—	
„ „ 24 g.	10	15	0		—	
„ „ 26 g.	12	5	0		—	
Sheet Iron, Galvanised, flat, ordinary quality—						
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12	15	0		—	
Ordinary sizes to 22 g. and 24 g	13	5	0		—	
„ „ 26 g.	14	5	0		—	
Sheet Iron, Galvanised, flat, best quality—						
Ordinary sizes to 20 g.	16	0	0		—	
„ „ 22 g. and 24 g.	16	10	0		—	
„ „ 26 g.	18	0	0		—	
Galvanised Corrugated Sheets—						
Ordinary sizes, 6 ft. to 8 ft. 20 g	12	15	0		—	
„ „ 22 g. and 24 g.	13	5	0		—	
„ „ 26 g.	14	0	0		—	
Best Soft Steel Sheets, 6ft. by 2ft. to 3 ft. by 20 g. and thicker	11	15	0		—	
Best Soft Steel Sheets, 22 g. & 24 g	12	15	0		—	
„ „ 26 g	14	0	0		—	
Cut nails, 3 in. to 6 in.	9	5	0	9	15	0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3lb. and up	14	2	6		—	
Pipe in coils	14	12	6		—	
Soil pipe	17	2	6		—	
Compo pipe	17	2	6		—	
ZINC—Sheet—						
Vieille Montagne ton	26	5	0		—	
Silesian	26	0	0		—	

LEAD, &c.—(*continued*)—

	Per ton, in London. £	s.	d.	£	s.	d.
COPPER—						
Strong Sheet per lb.	0	0	10½		—	
Thin „	0	0	11½		—	
Copper nails „	0	0	11		—	
BRASS—						
Strong Sheet per lb.	0	0	10		—	
Thin „ „	0	0	11		—	
TIN—English Ingots „	0	1	4		—	
SOLDER—Plumbers' „	0	0	6½		—	
Tinmen's „	0	0	8		—	
Plowpipe „	0	0	9		—	

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2d.	per ft.	delivered.
„ fourths	1½d.	„	„
21 oz. thirds	3d.	„	„
„ fourths	2½d.	„	„
26 oz. thirds	3½d.	„	„
„ fourths	3d.	„	„
32 oz. thirds	4½d.	„	„
„ fourths	4d.	„	„
Fluted sheet, 15 oz.	2½d.	„	„
„ 21 oz.	3½d.	„	„
½ Hartley's Rolled Plate	1½d.	„	„
⅝ „ „ „	2d.	„	„
¾ „ „ „	2½d.	„	„

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes or barrels	per gallon	0	1	8
„ „ „ in drums	„	0	1	11
Boiled „ „ in pipes or barrels	„	0	1	11
„ „ „ in drums	„	0	2	2
Turpentine, in barrels	„	0	3	8
„ in drums	„	0	3	10
Genuine Ground English White Lead	per ton	19	0	0
Red Lead, Dry	„	19	0	0
Best Linseed Oil Putty	per cwt.	0	7	6
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	0
Fine Elastic Carriage	0	12	6
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	16	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flatting Varnish	0	18	0
White Copal Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
French and Brush Polish	0	10	0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the author.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ABERDEEN.—For construction of a timber wharf, about 750 ft. long, and other work on the River Dee, for the Aberdeen Harbour Commissioners. Mr. R. Gordon Nicol, Engineer, Harbour Engineer's Office, Aberdeen:—

London and Tilbury Lighterage, Contracting, and Dredging Co., Ltd., 50, Mark-lane, London, E.C.*	£20,229 1 1

BINGLEY.—For sewering, paving, kerbing, flagging, of Whitley-street for the Urban District Council. Mr H. Bottomley, surveyor, Town Hall, Bingley:—

R. Naylor & Son	£711 14 3
D. Wildman	691 0 0
Midgley & Butterfield	665 5 6
Ross & Crabtree	657 17 0
W. Baker, Keighley*	626 12 1

(*Continued on page* 93.)

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*Designs for New School	Govs. of N'c'tle-on-Tyne R.G.S.	100l., 50l., 25l.	April 30
Hospital, Greenock	Hos. Board, Town Clerk, Greenock	Not stated	Feb. 2
Houses for Working Classes	Bangor City Council	20 Guineas	Feb. 20
*Design for Reconstruction of Meat Market	Haverfordwest Town Council	20 Guineas	No Date

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Hospital Furniture, Menstone	Wharfedale Hospital Committee	C. V. Newstead, Clerk, Union Offices, Otley	Jan. 23
Dormitories, Dining Hall, etc., Reed's Gmr. Schl, Drax	.....	E. and T. Clark, Clerks to Governors, Snaith	do.
Pulling Down and Re-buildg Post Office, etc., Bramley	.....	Kay & Long, Architects, 10, St. Paul's-street, Leeds	do.
Alterations, etc., Wheat Sheaf Inn, Borrowby	Dover and Newsome Baxter, Ltd.	J. E. Walton, Architect, Northallerton	do.
C.I. Sect. Pillars, etc., Electricity Works, Port Dundas	do.	W. A. Chaman, Engineer, 75, Waterloo-street, Glasgow	Jan. 25
Removal of Night Soil, etc.	Birkenhead Corporation	Chief Inspector of Nuisances, Town Hall, Birkenhead	do.
Retort House, Coal Stores, etc., at Gasworks, East-st.	Farnham Gas Company	Gas Company Offices, Gas Works, Farnham	do.
Scavenging, Middleton-St. George	Darlington R.D.C.	J. Robinson, Union Offices, Darlington	do.
Residence, Surgery, Coachhouse, etc., East-street	Dr. B. G. Heald	T. Winn & Sons, Architects, 92, Albion-street, Leeds	do.
Electric Light, etc., Kingston Dist. Library, Paisley-rd	Glasgow Corporation	City Engineer, City-chambers, Glasgow	do.
Excavating Site, etc., Classrooms, Barnard's Cross	Salisbury Diocesan Training Coll	J. Harding & Son, Architects, 58, High-street, Salisbury	do.
Re-construction of Tenements, Greenside Row	City of Edinburgh	Burgh Engineer, City-chambers, Edinburgh	do.
Tram Lines, Pits, etc.	Aston Manor Corporation	R. Green, A.M.Inst.C.E., 37, Waterloo-street, Birmingham	do.
Alterations to Tramway Depot, Witton Lane	do.	do.	do.
Church and Halls, Queen-street, Aberdeen	.....	W. E. Gauld, Architect, 258, Union-street, Aberdeen	do.
Draining, etc., Harpurhey	Manchester Corporation	Paving Department, Surveyor's Office, Town Hall, Manchester	do.
Draining, etc., Crumpsall	do.	do.	do.
Alterations, etc., to Business Premises, Pwllheli, Wales	D. Lloyd Jones	D. Lloyd Jones, High-street, Pwllheli, Wales	do.
Street Works (Joseph-street, etc.)	Derby Corporation	J. Ward, Borough Surveyor, Babington Lane, Derby	do.
Feeding, etc, Mains	Whitby U.D.C. (Electricity Dept.)	L. H. King, Electrical Engineer to the Council, Whitby	do.
Caretaker's House, Heworth	Felling Education Committee	H. Miller, Architect, Council Buildings, Felling	do.
Two Dwelling Houses, Leeds-road, Bradley	.....	J. H. Hall, Architect, Fartown, Yorks	Jan. 26
Shower Bath and Alterations at Gym., Palmyra-sq	Warrington Gymnasium Com.	Borough Surveyor, Town Hall, Warrington	do.
Hospital, Scalford-road, Melton Mowbray	Melton and Belvoir Hospl. Com.	E. Jeeves, Architect, Nottingham-street, Melton Mowbray	do.
Works in Rimrose-road, Park-street, etc., Bootle	The Corporation	Borough Engineers' Office, Bootle	do.
Making-up Lancaster-avenue, Liscard	Wallasey U.D.C.	District Engineer to Council, Public Offices, Egremont	do.
,, Briardale-road, Seacombe	do.	do.	do.
,, Passage, Albermarle-road, Seacombe	do.	do.	do.
,, ,, May-avenue, etc., Seacombe	do.	do.	do.
,, ,, Stringhey-road, etc., Egremont	do.	do.	do.
,, ,, Norman-road, etc., Seacombe	do.	do.	do.
,, ,, St. Paul's-road, Seacombe	do.	do.	do.
,, ,, Green-lane, Wallasey	do.	do.	do.
,, ,, Wallasey Village (the Poplars)	do.	do.	do.
Wooden Troughing for Cables	Glasgow Corporation	W. A. Chamden, Engineer, 25, Waterloo-street, Glasgow	do.
*Enlargement of Sorting Office, Upper Holloway	Commiss. of H.M. Works, etc.	H.M. Office of Works, Storey's Gate, S.W.	do.
Marble Statue of the Virgin Mary, Ch'p'l of Wrkhse	Rathdown Guardians	P. Cunniam, Clerk to Union, Loughlinstown, Dublin	Jan. 27
Seven Through Houses, Wakefield-road, Earlsheaton	.....	Bank Top, Earlsheaton, Yorks	do.
Bank Office, Banbridge, co. Down	Ulster Bank, Ltd.	W. H. Stephens & Sons, Donegall-square North, Belfast	do.
Steel Casings for Lime Kilns, Provan Gasworks	Glasgow Corporation	A. Wilson, Engineer, 45, John-street, Glasgow	do.
Semi-detached Villas, Headingley	.....	J. Charles & Sons, 98, Albion-street, Leeds	do.
Inspector's House and Four Cottages, Church Fenton	N.E. Railway Company	W. Bell, Architect to the Company, York	do.
Improvements to Cottages, Church Fenton	do.	do.	do.
Meat Store, etc., Enfield Workhouse	Guardians of Edmonton Union	T. E. Knightley, Architect, 106, Cannon-street, E.C.	do.
Sluice Valves, etc., Talla Waterworks	Edinburgh Water Trustees	W. A. Tait, C.E., 72a, George-street, Edinburgh	do.
350-Gallon Water Van	Branksome U.D.C.	S. J. Newman, Surv., Council Bldgs., Branksome, Parkstone, R.S.O.	do.
Steel Casings for Lime Kilns, etc.	Glasgow Corporation	A. Wilson, Engineer, 45, John-street, Glasgow	do.
*Granite Kerb	Hove Corporation	Borough Surveyor, Town Hall, Hove	do.
Sewers, etc.	Wokingham Town Council	C. W. Marks, Borough Engineer, Town Hall, Wokingham	Jan. 28
Additions, Elland Grammar School	.....	F. F. Beaumont, Architect, Southgate Chambers, Halifax	do.
Synagogue, Annesley-street, Belfast	.....	S. C. Hunter, Building Surveyor, Belfast	do.
Post Office, Belturbet, co. Cavan	.....	Office of Public Works, Dublin	do.
Cooking Appliances, Workhouse, Merthyr Tydfil	Merthyr Tydfil Guardians	T. Roderick, Architect, Aberdare	do.
Marton Beck Valley Sewer	Middlesbrough Corporation	F. Baker, Borough Engineer, Middlesbrough,	Jan. 29
Draining, etc., Withington-road, Whalley Range	Withington U.D.C.	A. H. Mountain, Surveyor to Council, Town Hall, West Didsbury	do.
Drainage, etc., Works Tolworth Joint Hospital	Joint Hospital Board	Carter & Ashworth, Architects, 86, Eden-st., Kingston-on-Thames	Jan. 30
Two Houses, Norfolk-square, Great Yarmouth	F. Allen	C. G. Baker, Architect, Town Hall Chambers, Great Yarmouth	do.
Fire Engine House Works, Carrickfergus, Ireland	Carrickfergus U.D.C.	J. Boyd, Clerk, Town Hall, Carrickfergus	do.
Market Sheds, Carrickfergus, Ireland	do.	do.	do.
Dwelling House, Newport, Pembrokeshire	.....	W. Davies, The Cross House, Newport, Pembrokeshire	do.
Timber Safety Fencing, Badenoch District	.....	A. Mackenzie, C.E., Surveyor, Kingussie	do.
Wesleyan Meth. Ch., Connor Down, Hayle, Cornwall	.....	O. Caldwell, F.R.I.B.A., Penzance	do.
Forty-Four School Cupboards	Newcastle-on-Tyne Educa. Com.	Education Offices, Northumberland-road, Newcastle-on-Tyne	Jan. 31
Promenade Extension and Lavatories	Redcar U.D.C.	J. Howcroft, Surveyor, Council Offices, 2, West-terrace, Redcar	do.
Promenade Extension	do.	do.	do.
Lavatories	do.	do.	do.
Band Stand	do.	do.	do.
Boundary Wall, 54, Radnor-street, London	Kingshill Co-operative Society	Society's Offices, 54, Radnor-street, London	Feb. 1
Sixteen Artisan Dwellings, Mallow, Ireland	Mallow U.D.C.	Brian E. F. Sheehy, Architect, 57, George-street, Limerick	do.
Coal Store, etc., Chesterfield-road Pumping Station	Mansfield Corporation	G. & F. W. Hodson, Engineers, Loughborough	do.
Fire Station, Buttway-lane	Cliffe (Kent) Parish Council	F. E. Rogers, Clerk, Parish Council Offices, Cliffe	do.
Additions, etc., House at Shanakiel, Cork	.....	W. H. Hill & Son, Architects, 28, South-mall, Cork	do.
Stores, Borough Engineer's Department	Southampton Corporation	J. A. Crowther, Borough Engineer, Southampton	do.
Pulling Down 35, Mary-le-Port-st., & Erecting Wareh.	Messrs. Lindrea & Co.	H. J. Jones & Son, Architects, 12, Bridge-street, Bristol	do.
Materials	Grimsby Corporation	H. G. Whyatt, Borough Engineer, Town Hall, Grimsby	do.
Files, Rasps, and Rubbers	Army Ordnance Department	H. de la Bere, War Office, Pall Mall, London, S.W.	do.
Library, Whitchurch, near Cardiff	.....	R. & S. Williams, Architects, Boro'-chambers, Wharton-st., Cardiff	do.
Wharf, Cattewater Harbour, etc.	Plymouth Corporation	Sir J. Wolfe Barry, Engineer, 21, Delahay-street, London, S.W.	do.
Covered Play Grounds, etc.	Trevesham School Board	Lansdowne & Griggs, Architects, Newport, Mon.	do.
Warehouses, Nelson-street	Glasgow Corporation	Thomson & Sandelands, Archts., 241, West George-st., Glasgow	do.
*Power House, etc., Technical Inst., Paddington	L.C.C.	Arch. Dept. (General Construction Section), 15, Pall Mall East, S.W.	do.
*Isolation Hospital	Hitchin Joint Hospital Board	See Advt. in this issue	do.
High School for Girls, Yarm-road, Stockton-on-Tees	Governors, Q. Victoria High School	C. J. Archer, Clerk to Governors, 77, High-st., Stockton-on-Tees	Feb. 2
Oil Engine and Pump at Stonerig Filters, Armadale	Bathgate Com., Linlithgow Cy. Cl.	W. A. Tait, C.E., 72a, George-street, Edinburgh	do.
Cutting Tracks and Laying C.C. Pipes, Stonerig Filters	.....	do.	do.
Underground Lavatory Works	Herne Bay U.D.C.	F. W. J. Palmer, Surveyor to Council, Herne Bay	do.
Salesman's Office, St. George's-terrace	Canterbury Markets Committee	A. C. Turley, City Surveyor, Guildhall-street, Canterbury	do.
Kingston-lane Improvement	Teddington U.D.C.	M. Hainsworth, Surveyor, Teddington	do.
*Roadmaking Works	Chingford U.D.C.	Council's Surveyor, 14, The Parade, Chingford	do.
Restoration of Cranwell Church, Sleaford	.....	G. R. Boreham, 24, John-street, Sunderland	Feb. 3
5-ton double-barrelled loco. Steam Crane	Warrington Gas Committee	W. S. Haddock, Engineer, Gas Offices, Warrington	do.
Pipe Sewers	Dorking R.D.C.	W. Rapley, jun., Surveyor, Clovelly, Tower Hill, Dorking	do.
Sewage Disposal Wks., Pumping Sta., etc., Westcott.	do.	do.	do.
Retort Stoking Machinery, etc., Liverpool Works	Gas Committee, Salford Corp.	W. W. Woodward, Engineer, Gas Offices, Bloom-street, Salford	Feb. 4
*Erection of Stabling and Disinfecting Station	Boro' of Bethnal Green	Town Clerk, Town Hall, Church-row, Bethnal Green	do.
Wesleyan Sunday School, King's Cross, Halifax	Trustees	A. G. Dalzell, Architect, 15, Commercial-street, Halifax	Feb. 5
757 Desks and 60 other articles, Hyde Park Schools	Plymouth Education Authority	E. Chandler Cook, 18, Princess Square, Plymouth	Feb. 6
Stores for Engineer's Department	Wallasey U.D.C. Health Com'ittee	W. H. Travers, Dist. Engineer, Pub. Offices, Egremont, Cheshire.	do.
Stores	Works Com'ittee, Wallasey U.D.C.	do.	do.
Rebuilding Stone Bridge, Embleton South Farm	Alnwick R.D.C.	H. W. Walton, Clerk, Alnwick	Feb. 8
Longdene-road Works, Haslemere	Hambledon R.D.C.	F. Smallpiece, Clerk, 138, High-street, Guilford	do.
Alterations and Additions to Workhouse	Hailsham Union	Mitchell & Ford, Architects, 7, Gildredge-road, Eastbourne	Feb. 9
*Supplies, etc.	West Ham Council	Borough Engineer, Town Hall, Stratford, E.	Feb. 11
*New Coastguard Station, etc., St. Leonards	Admiralty	Director of Works Dept., 21, Northumberland-avenue, W.C.	Feb. 12
Single Line Railway, Dunfermline to Kincardine	North British Railway Company	Blyth & Westland, Engineers, 135, George-street, Edinburgh	Feb. 15

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Broken Granite	Essex County Council	P. J. Sheldon, Chief Surveyor, Chelmsford	Feb. 15
Caisson for Royal Edward Dock, Avonmouth	Bristol Docks Committee	W. W. Squire, Engineer, Cumberland-road, Bristol	do.
3 pairs of Lock Gates for Entrance Lock, Avonmouth	do.	do.	do.
An Opening Bridge, Royal Edward Dock, Avonmouth	do.	do.	do.
*Supply of Broken Granite	Essex County Council	Chief Surveyor, Chelmsford	do.
*Erection of Public Baths	Chiswick U.D.C.	Council's Surveyor, Town Hall, Chiswick	Feb. 17
Sludge Vessel, Dublin	Improvements Committee	Spencer Harty, M.Inst.C.E.I., City Hall, Dublin	Feb. 23
Painting, etc., 4 Wards	*Derby County Asylum Com.	Mr. McWilliams, Resident Engineer at Asylum, Mickleover	Feb. 25
Police Station, Stradbroke, Suffolk	East Suffolk County Council	H. Miller, County Surveyor, 16, Museum-street, Ipswich	do.
Asylum, etc., Narborough, near Leicester	Committee of Visitors	Everard & Pick, Millstone-lane, Leicester	Feb. 27
*New Asylum, Narborough	Leicestershire, etc. Lunatic Asy.	Everard & Pick, Architects, Millstone-lane, Leicester	do.
*Municipal Offices and other Buildings	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham	Mar. 1
*Erection of Epileptic Homes, &c.	Chorlton & Manchester Asyl. Com.	Giles, Gough, & Trollope, 28, Craven-street, Charing Cross, W.C.	Mar. 4
Repairs, Congregational Chapel, Old	Mr. Longley	T. Ponton, Old	No date
Five-Story Shop Premises, Land's-lane, Leeds		Mosley's Rent Collectors, 5, Wormald-row, Leeds	do.
Alterations, etc., Bilton Church, Harrogate		A. A. Gibson, Architect, 5, Prospect-crescent, Harrogate	do.
*Free Library in Victoria-avenue	Harrogate Corporation	H. T. Hare, Architect, 13, Hart-street, Bloomsbury, W.C.	do.
Sinking Vertical Shaft about 60 fathoms		The Manager, Llanfair Mines, Ltd., near Abergele, N. Wales	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
Chief Assistant to Borough Surveyor and Engineer	Folkestone Corporation	150*l.*	Jan. 25
Mains Superintendent at Electricity Works	Wimbledon U.D.C.	125*l.*	do.
Surveyor and Inspector of Nuisances	Barnard Castle U.D.C.	120*l.*	Jan. 25
*Clerk of Works	Coventry Education Committee	4*l.* per week	do.
*Architectural Assistant	Barrow-in-Furness Corporation	120*l.*	Jan. 27
Chief Assistant Electrical Engineer	Corporation of Croydon	200*l.*	Jan. 30
Surveyor, Havering and Dagenham Levels	The Hon. Com. of Sewers, Romf'd	450*l.*	Feb. 1
Surveyor, Rainham Levels	The Hon. Com. of Sewers, Romf'd	150*l.*	do.
Engr. to make Plans, etc., for Concrete Reservoir, etc.	Maryboro'(Ireland)W't'rwks. Com.	.....	do.
Surveyor, Waterworks Engineer, Sanitary Inspector	Midsomer Norton U.D.C.	120*l.*	Feb. 4
*Clerk of Works	Leicestershire, etc., Lunatic Asy.	5*l.* 5*s.* per week	Feb. 16
*Instructor, Mechanical Engineering Department	Northampton Inst., Clerkenwell	Not stated	No date
*Clerk of Works	N. Riding Education Committee	See Advt. in this issue	do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*, xix.

BIRKDALE.—For erecting a hospital, Birkdale, for the Urban District Council :—

T. Pickup & Co., Linaker-street, Southport £1,879 0 0

BROADSTAIRS.—For 1,030 ft. run of Norway granite edge kerb, channel, etc., for the Broadstairs and St. Peter's Urban District Council. Mr. H. Hurd, Town Surveyor, Council Offices, Broadstairs :—

Burgess & Burgess	£145 0 7
L. Sommerfeld	144 13 4
A. Brunton & Son	140 12 6
Brookes, Ltd.	137 19 7
W. Griffiths & Co.	136 1 2
Blichfeldt & Co.	131 11 3
J. Goodchild & Co.	131 4 7
A. & F. Manuelle	131 1 3
E. J. Van Praagh & Co., London*	128 19 7

CHICHESTER.—For alterations to 81 and 82, East-street, for Messrs. Halsted & Sons. Messrs. Wade & Austen, architects, East-street, Chichester. Quantities by architects :—

C. Hooker & Sons	£2,236 5 11
A. Crouch	2,147 0 0
A. Burrell, Arundel and Littlehampton†	2,119 0 0
F. Hill	2,036 0 0

COALVILLE.—For new sewers, Whitwick main drainage, for the Urban District Council. Mr. J. B. Everard, M.Inst.C.E., 6, Millstone-lane, Leicester :—

Joshua Jameson	£22,986 12 4
J. & T. Binns	21,401 0 0
F. W. Trimm	21,231 0 0
J. S. Dawson	20,986 5 2
G. M. Kerry & Co.	20,073 0 8
Simon Johnson & Son	19,935 13 9
John Holme	18,846 0 0
A. Braithwaite & Co.	18,147 6 7
Johnson & Langley	17,717 0 0
Bentley & Logh	17,692 0 0
G. F. Tomlinson	17,503 10 0
John Fletcher	17,323 6 6
Edward Orton	17,163 0 4
W. Brigg	17,105 0 0
J. Hodson & Son	16,901 11 3
W. Moss & Sons, Ltd.	16,772 10 0
Robert Wood, Bingley, Yorks*	16,054 0 0

CROSTHWAITE (Cumberland).—For the erection of Rough How Bridge, on the Keswick and Ambleside road, for the Cumberland County Council. Mr. G. J. Bell, A.M.Inst.C.E., County Surveyor, Carlisle :—

T. Telfer, Langholm, N.B.*	£744 6 9
Millward & Co.†	615 9 9

†This does not include the whole of the roadway.

FEATHERSTONE (Yorks.).—For the supply of kerb, flags, setts, etc., for year ending December 31, 1904, for the Urban District Council. Mr. F. B. Rothera, Surveyor, Council Offices, Featherstone :—

	Per rood.
Marshall & Co., 6 in. setts, Halifax	£2 10 6
	Per yard.
Farrars, Ltd., 12 in. by 8 in. kerb, Brighouse	0 3 3
Marsden & Co., 6 in. by 15 in. kerb, Brighouse	0 2 7
Marsden & Co., 5 in. by 15 in. kerb, Brighouse	0 2 3
Threlkeld Granite Co., 2½ in. flags, Keswick	0 3 7
Bentley & Smith, 3 in. Corp flags, Brighouse	0 4 0
Marsden & Co., 3 in. self-faced flags, Brighouse	0 3 4
Marsden & Co., 3 in. knotted flags, Brighouse	0 3 2
T. Sheffield, 2½ in. self-faced flags, Brighouse	0 2 10
Farrars, Ltd., 12 in. by 8 in. kerb, Brighouse	0 4 3

HOUNSLOW.—For public offices, baths, and free library, Treaty House Estate, for the Heston and Isleworth Urban District Council. Messrs. Nowell Parr & A. E. Kates, architects, Brunswick House, Brentford. Quantities by Mr. T. J. Carless, 39, Old Queen-street, Westminster :—

	Public Offices.	Baths & Supt. Cott.	Library.	Total.
J. W. Brooking	£16,989	£13,326	£5,597	£35,912
Chamber Bros.	17,202	12,930	5,512	35,644
Chamberlain	14,954	—	4,673	—
Cowley & Drake	15,025	12,001	4,802	31,828
Cropley Bros.	16,334	12,858	5,276	34,468
F. E. Davey, Ltd.	16,557	12,137	5,093	33,787
J. Dorey & Co., Brentford	14,636*	11,090*	4,734	30,460
Ferguson & Co.	15,189	11,807	4,733	31,729
Gaze & Sons	—	—	4,767	—
Galbraith Bros.	15,738	12,400	4,841	32,979
Godson & Son	15,680	12,656	5,071	33,407
Gough & Co.	15,200	11,875	5,089	32,164
Hadley & Co.	14,781	12,508	4,902	32,191
A. & B. Hanson	14,448	11,333	4,713	30,494
F. & H. F. Higgs	16,631	13,345	5,317	35,293
Higgs & Hill	16,200	12,900	5,200	34,300
C. Gray Hill	14,500	11,600	4,700	30,800
M. Hughes	15,995	11,950	4,890	32,835
Hughes & Stirling	15,695	12,522	5,442	33,659
Leslie & Co.	15,200	12,273	4,962	32,435
Lorden & Son	15,500	12,790	5,149	33,439
Mowlem & Co.	15,798	12,970	5,008	33,776
Nightingale	15,911	12,780	4,988	33,679
Messum & Son	15,666	11,877	5,175	32,718
Patman & Fotheringham	15,041	11,923	4,800	31,764
Saunders	15,491	12,497	5,085	33,073
Shillitoe	16,000	12,500	4,950	33,450
Soole & Son	14,990	12,272	4,965	32,227
W. Wallis	15,695	12,241	5,173	33,109
Wisdom Bros., Isleworth	14,800	11,345	4,700*	30,845
Architects' estimate	15,000	10,500	5,000	30,500

HANLEY.—For three shops, Piccadilly, Hanley. Mr. Elijah Jones, architect, 10, Albion-street, Hanley :—

J. Cope	£2,002 17 8
E. Roberts	2,000 0 0
T. Chatfield & Sons	1,980 0 0
J. Cooke	1,930 0 0
A. Ward	1,865 0 0
Colley & Lindop	1,840 0 0
G. Ellis	1,760 0 0
T. Godwin	1,700 0 0
C. Cornes & Sons, Litchfield-street, Hanley*	1,600 0 0

LONDON.—For 500 tons of Guernsey granite spalls, at the Workhouse, Notting Hill, for the Kensington Board of Guardians :—

	Per ton.
A. B. Manuelle, 57, Gracechurch-street, E.C.	£0 9 11

LONDON.—For the erection of additional nurses' quarters at the South-Eastern Ambulance Station, New Cross-road, S.E., for the Managers of the Metropolitan Asylums District. Messrs. T. W. Aldwinckle & Son, architects, 20, Denman-street, S.E. Quantities by Messrs. W. H. Barber & Son, 22, Buckingham-street, Adelphi, W.C. :—

C. B. Roberts & Co.	£2,525 10 0	W. Martin	£1,673 0 0
Kirk & Randall	2,314 0 0	T. Cole	1,621 0 0
E. Proctor & Son	2,119 0 0	W. Johnson & Co., Ltd.	1,610 0 0
J. O. Richardson	2,021 0 0	T. G. Sharpington	1,598 0 0
R. H. Lowe	1,875 0 0	W. Lawrence & Son	1,594 0 0
H. Wall & Co.	1,721 0 0	W. Reason, 47, Rosebery-avenue, E.C.*	1,547 0 0
Enness Bros.	1,693 0 0		

LONDON.—For two new Lancashire boilers, etc., at the workhouse, for the Bethnal Green Board of Guardians. Mr. G. H. Hughes, M.I.M.E., 97, Queen Victoria-street, E.C. Quantities by the engineer :—

	Temporary Boilers, etc.	Two New Boilers.	Builder's Work.	For the Three Old Boilers.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Anderton & Sons	1,052 9 6	966 0 0	554 15 1	20 0 0
Adamson & Co.	—	770 0 0	—	—
Arnott & Co.	—	815 0 0	—	—
Bulford	—	—	649 0 0	—
Clayton, Son, & Co.	—	793 0 0	—	—
Danks & Co.	1,070 0 0	777 10 0	620 0 0	25 0 0
H. T. Danks, Ltd.	927 7 0	823 8 0	1,042 3 0	15 0 0
Davy Brothers, Ltd.	834 10 0	809 5 0	683 2 9	25 0 0
Foster & Sons	—	784 0 0	—	—
Fraser & Son	827 18 0	888 13 6	—	5 0 0
Fraser & Fraser, Ltd.	883 0 0	1,013 0 0	684 0 0	15 0 0
Gimson & Co., Ltd.	—	870 0 0	—	—
Greene & Co.	—	859 14 4	—	—
Goddard, Massey, & Warner	849 14 6	1,252 0 0	2,810 10 1	30 0 0
Galloways, Ltd	757 0 0	—	—	—
Hewitt & Kellett, Bowling Ironworks, Bradford	785 0 0*	713 0 0*	638 0 0	30 0 0*
Hughes & Stirling	1,010 15 6	1,180 4 9	757 4 3	—
Hilton & Sons	—	—	674 0 0	—
Horsfield, Ltd.	—	854 19 0	—	—
Marshall & Co.	778 0 0	—	—	—
Maxim Engineering Company	1,129 19 6	—	—	—
May	798 0 0	832 0 0	724 10 0	12 0 0
Ruston, Proctor, & Co., Ltd.	896 0 0	—	—	—
Spurr, Inman, & Co., Ltd.	—	801 16 6	—	—
Shillitoe & Son	—	—	675 0 0	—
Tinkers, Ltd.	845 5 9	832 0 0	—	—
Thompson	—	768 6 0	680 14 4	35 0 0
Wellerman Bros., Hyde	—	—	598 0 0*	—
Yates & Co.	—	—	575 0 0	—

LONDON.—For new river wall and foundations of chimney shaft at proposed power station site, Old Barge House Wharf, Blackfriars, for the Commissioner of H.M. Works and Public Buildings :—

		Credit Old Materials.
A. G. Osenton	£7,673 0 0	—
T. E. Pedrette	5,959 0 0	—
Foster & Dicksee	5,888 0 0	50
Perry & Co.	5,490 0 0	45
B. E. Nightingale	5,000 0 0	—
Stephen Kavanagh & Co.	4,743 0 0	31
F. S. Minter	4,564 0 0	—
Johnson & Co.	4,460 0 0	50
W. H. Lorden & Son	4,444 0 0	—
Montague Dinnie	4,216 11 0	—
Joseph T. Firbank, Ltd.	4,065 0 0	50
Pethick Brothers	3,987 0 0	—
Anthony Fasey & Son	3,887 2 4	—
Charles Ansell	3,838 0 0	50
Robert H. B. Neal	3,835 0 0	—
Frank Miskin	3,800 0 0	—
Case Sea Defence Syndicate, Ltd.	3,800 0 0	9
Henry Lovatt	3,763 14 3	6·10
Edward Good & Sons, Ltd.	3,752 16 2	70
J. Sangwin	3,499 14 3	20
J. Mowlem & Co., Ltd.	3,419 0 0	—
J. A. Ewart	3,140 0 0	15

MIDGEHOLME.—For the erection of a stone skew bridge across Blackburn, in Brampton district, for the Cumberland County Council. Mr. G. J. Bell, M.Inst.C.E., County Surveyor, Carlisle. Contractor takes his own quantities from plan :—

R. Little	£1,113 6 8	T. Telfer, Contractor, Langholm, N.B.*	£763 14 6
Millward & Co.	929 7 0		
T. Nixon	918 19 0		

NAAS (Ireland).—For a medical officer's residence, dispensary, and out-offices at Tully West, near Kildare, for the Guardians. Mr. Francis Bergin, B.E., 36, Westmoreland-street, Dublin. Quantities by engineer :—

James Taylor	£1,448 0 0
D. & J. Carberry, Athy*	1,320 0 0
James Kelly	800 0 0

SALTLEY.—For the erection of five pumping stations between the works at Saltley and Minworth, for the Birmingham, Tame and Rea District Drainage Board. Mr. J. D. Watson, A.M.Inst.C.E., Engineer to the Board, Tyburn, near Bromwich Station :—

H. Barnes	£1,880 0 0
Smith & Pitts	1,833 0 0
W. & J. Webb	1,800 0 0
Stafford & Mansfield	1,790 0 0
W. Sapcote & Son	1,788 0 0
H. Wilcock & Co.	1,775 0 0
J. Dallon & Sons	1,750 0 0
J. Langley	1,749 12 5
W. Hopkins	1,700 0 0
T. Johnson	1,667 0 0
E. Garfield	1,650 10 0
W. H. James, Sutton Coldfield*	1,548 0 0

SLOUGH.—For street works, Hillside, for the Urban District Council. Mr. W. W. Cooper, Surveyor to the Council, Slough :—

Johnson & Langley	£970 0 0
Lawrence & Thacker	875 0 0
Nowell & Co.	864 0 0
London and County Builders' Association	775 0 0
Free & Sons	754 0 0
J. H. R. Atkins	691 0 0
Watson, jun.	656 0 0
J. Smith, High Wycombe*	640 0 0

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SOUTHAMPTON.—For erecting the new Portswood schools, etc., for the Education Committee. Mr. J. A. Crowther, Borough Engineer, 123, High-street, Southampton :—

Golding & Ansell	£18,000 0 0
S. Salter	17,518 0 0
W. Jupe	17,364 12 0
Musselwhite & Sapp	17,350 0 0
Exors. of late W. Franklin	17,280 0 0
Rashley & Son	17,187 0 0
J. Nichol	16,379 10 0
Stevens & Co.	16,353 0 0
Playfair & Toole	15,962 0 0
Jenkins & Sons	15,874 0 0
Dyer & Son, Southampton*	15,170 0 0

SOUTHEND-ON-SEA.—For extension of car-shed at electricity works, for the Corporation. Mr. E. J. Elford, Borough Engineer, Southend.

Baker & Wiseman	£3,220 19 0
F. & E. Davey	3,175 11 10
Ernest West	2,958 0 0
J. Carter & Co.	2,944 11 10
R. Elvy	2,880 12 0
S. E. Moss & Co.	2,798 8 10
F. E. Woodhams	2,790 0 0
J. E. Flaxman, Southend*	2,647 10 2

[Borough Engineer's estimate, £2,950].

STOCKPORT.—For erection of offices for the superintendent of the sanitary depôt, Portwood, for the Cleansing Committee of the Corporation. Mr. J. Atkinson, Borough Surveyor, Stockport :—

D. Mullaney	£195 0 0	W. C. Broadhurst	£163 5 0
J. Longson	185 0 0	W. Pownall	159 4 11
S. Kitchen	176 10 0	J. Haigh	155 16 3
J. Broadhurst	175 0 0	F. & E. Foulkes	154 12 1½
R. Williamson	168 0 0	W. B. Beattie, Gradwell-st. Stockport*	140 15 0
T. Hoe	166 18 0		
J. Briggs	164 0 0		

WISBECH.—For the erection of residence, Wisbech, for Mr. J. T. Evison. Mr. G. Thorpe, architect, Post Office-lane, Wisbech. Quantities by the architect :—

W. Saint	£1,633 0 0	G. J. West	£1,475 0 0
W. H. Brown	1,597 16 0	Hipwell & Co.	1,385 0 0
R. Dye	1,578 0 0	J. W. Wilkinson*	1,250 0 0
J. R. Bateman	1,570 0 0		
H. Rands & Son	1,556 19 0		

YORK.—For the erection of an auction mart, offices, pens, and roofing at the cattle market for the Corporation. Mr. A. Creer, City Engineer, Guildhall, York :—
W. Bellerby, Hungate Saw Mills, York* £6,200 15 0

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